THE

WEALTH OF INDIA.

A Monthly Magazine of Practical Information and Useful Discussions

EDITED BY MR. G. A. VAIDYARAMAN, B.A.

Vol. II.] JUNE 1913 [No. 6

The Wealth of India.

The object of this Monthly is to publish the views of experts on the various problems bearing on material progress, specially agriculture, commerce, industry, economics, co-operation, banking, insurance, popular, scientific and technical education, to digest the notable articles appearing in the leading magazines and periodicals and generally to serve as a record of practical information, and useful discussions. It is believed such a publication is indispensable to statesman, publicists, businessmen, students of economics and all others interested in the material and moral advancement of the country.

RATES OF SUBSCRIPTION POST FREE.

	Inland. Rs. A. P.		Foreign. s. d.
Per annum	... 5 0 0	...	12 0
Single copy	... 0 8 0	...	1 0
Sample copy	... 0 2 0	...	1 0

Notice to Contributors—The Editor solicits contributions on subjects falling within the scope of the journal. Articles should not ordinarily exceed 2,000 words and should be written on one side of the paper only and on half margin. All articles which may be accepted will be paid for on publication. It will be understood that the publishers may at their discretion republish in any form or issue translations of, articles which have been paid for at the time of publication in the journal.

No money should be paid to any Agent. All remittances and letters should be addressed to the publishers, Messrs. G. A. VaidyaRaman & Co., 3, and 4, Sunkurama Chetty Street, Georgetown, Madras.

Current Topics

BY ECONOMICUS.

Mysore Economic Conference.

BY common consent Mysore takes a high rank among the Native States of India. The policy of the Mysore Durbar has been progressive and special attention has been paid to the development of the economic resources of the State. At the realm of the enlightened administration in Mysore now stands Mr. M. Visvesvarayya whose grasp of the essentials of progress is evidenced by the address he delivered as President of the Mysore Economic Conference. Many of the remarks he made touching the condition of the people in Mysore are equally applicable to their countrymen outside and hence they deserve careful consideration at the hands of the public in general. He pointed out the contrast between a country like India where the great bulk of the people are uneducated and agriculture is their chief occupation and the progressive nations of the west. "Every European country," he observed, "believes that activity, brains, science, and thoroughness are necessary for ensuring a high standard of living; and the government and leaders of those countries are untiring in their efforts to equip the people with the necessary skill and energy. Such countries are prospering and are yearly adding to their stores of wealth." The comparative statistics he gave are most striking and are calculated to give food for serious thought and rouse the most sluggish temperament to action. To take up only such

figures as are of direct economic interest, we find that the value of manufactured produce in the United Kingdom is Rs. 326 per head and that in Mysore is only one thirtieth of that amount. In the United Kingdom, only about one-eighth of the people are engaged in agriculture, in Germany one-sixth, in Japan three-fifths, while in Mysore three-fourths of the population are so dependent. The number of those dependent on agriculture has recently swollen by the addition to its ranks of unskilled artisans who have lost their industries on account of the fierce competition of the manufactured products of foreign countries. The calculated earning power of an average Mysorean is about Rs. 30 per head per annum, whereas an average European earns about Rs. 400 per head and an average Englishman Rs. 600 to Rs. 700. Mr. Visvesvarayya is anxious that sound ideas on economic subjects should spread widely among people and gradually reveal to them the causes of their inferior position as compared with the progressive countries and indicate the spheres of work in which they might profitably engage themselves in future. The Mysore Economic Conference is not four years old and yet within this short period of its existence it has given promise of a useful future. We are told that the Bank scheme is now taking shape, that a department of Industries and Commerce has been brought into existence, a few installations for the manufacture of jaggery and other industrial experiments have been started and a substantial move made in connection with technical and commercial education. We congratulate the Mysore Durbar on the advance that the State is making in the direction of industrial and economic development and hope that its efforts may be crowned with success. It is our firm conviction that the rulers of Indian Native States stand in a position of peculiar privilege and responsibility. Certain urgent measures which the British Government are not in a position to take as being opposed to the general fiscal and economic policy of the Imperial Government are within the power of our Durbars and they can set an example in progressive and beneficent administration that may be followed with advantage elsewhere. The concluding passage in Mr. Visvesvarayya's address will bear repetition :—" If the intelligence of our people is kept undeveloped, their skill untrained, their activities unstimulated, the average standards of working and living will remain low, and the country will continue to be populated, as at present, by ignorant, unskilled and indolent masses who, in times of scarcity or stress, will be unable to help themselves. Safety therefore lies in educating the people and equipping them with skill and science and keeping them active. This is what His Highness' Government have in view in introducing the various measures for improving the economic efficiency of our people."

Morison Committee's Report.

The report of the Morison Committee which was appointed by the Secretary of State to inquire into the grievances of Indian technological students in England that they were not admitted to factories to acquire practical training and experience, has now been presented to Parliament. It may be recollected that the cause of Indian students had been taken up by Sir Theodore Morison who pointed out to British manufacturers their unwisdom in excluding these students from their industries. The committee was instructed to enquire what facilities there existed in England for Indian students going there for technical education and whether the system of technological state scholarships initiated in 1904 by the Government of India was working satisfactorily. We learn hat the committee found very little evidence of social prejudice against Indians 'who are readily admitted into those industries in which apprenticeship and pupilage are customary.' It is difficult to reconcile this finding of the committee with the complaints that were made by Indian students and with the remonstrance addressed by Sir Theodore to British manufacturers. A correspondent who is thoroughly acquainted with the real situation writes to

a contemporary saying, "if prejudice against us as coloured persons did not exist on the part of British mannfacturers, the committee of inquiry was lacking in its very *raison d'etre.* We know very well that in very many cases our efforts to secure an entrance in English factories of repute after paying the necessarily high premium and after fortifying ourselves with the best notes of introduction available, have miserably failed—for no other reason than the simple one of the extreme reluctance of factory officials to work with coloured persons". It is no use denying the fact that manufacturers in England are unwilling, from whatever cause, to admit Indian students to their factories, and the case of one such manufacturer who naively expressed his unwillingness to admit an Indian student to his factory on the ground that techincally trained Indians were detrimental to the interests of British industries, is well known. The Morison committee are further of opinion that Indian technological students generally do well, being quite up to the average capacity of their classes, provided they come with a fair grounding of education and practical experience. In view of the necessity for practical experience in works, the report recommends an extension of the period of tenure of the state scholarships, which it says should range between three and five years. The report urges a higher standard of selection in India, preliminary practical experience being highly desirable, and in the case of mining students. indispensable. These views of the committee are certainly reasonable and we are glad to find that the recommendation which had proceeded from certain quarters that the state scholarships should be abolished has not been countenanced by it. In fact, the number of scholarships ought to be increased and greater facilities be afforded to Indian students for technological instruction in this country and in England.

Savings Banks in India.

A correspondent writing to the *Madras Mail* makes three very useful suggestions calculated to promote the healthy growth of savings banks in India so as to render them helpful to the Agricultural and Industrial classes who suffer badly from lack of capital. It was just thirty years ago that Government savings banks were introduced in this country and attached to the Post Office Department. Since then the banks have made a steady progress and the number of depositors and the amount of deposits have gone on increasing. Thrifty by nature and instinct, the people of India have felt that they might with great advantage put by their savings in banks established on the security of Government. Thus the habit of thrift is encouraged and the accumulation of large quantities of capital rendered possible. But the progress made by the Postal Savings Banks is not commensurate with the extent and the population of India. It has been calculated that the average balance at credit of a depositor in India is Rs. 115-11-0 while in France it is Rs. 218-8 0 and in Great Britain and Ireland Rs. 229. Taking the amounts deposited in the savings banks to represent the aggregate savings of the people, we find that the average annual saving per head of population is 8 as. 7 ps. This unsatisfactory state of things is attributed to the paucity of savings banks. In the Madras Presidency, for instance, we are told, there is not more than one bank for 79 sq. miles, that is, for 21,251 inhabitants. With the spread of primary education among the masses, it is to be expected that the desire to accumulate savings will become more widespread. In the opinion of the writer in the Madras paper the lowering of the limit of the minimum deposit from as. 4 to as. 2 will lead to an increase in the number of depositors and the amounts of the deposits. Even in a wealthy country like England there are Penny Banks designed especially to be the repositories of the loose pence, which, but for this means of investment, would be spent uselessly. The Yorkshire Penny Bank is reported to have 858 branches, nearly 500,000 depositors and deposits amounting to 24 crores of rupees. Secondly, the number of the banks must be increased. Though it may not be possible to

effect any considerable increase in this respect, the Branch Post Offices, which are now precluded from transacting savings bank business, should be empowered to receive deposits. The fact that the amounts of deposits have, in the past, progressed with the multiplicity of savings banks, points to the certain probability that the opening of more Government savings banks will result in an appreciable increase in the savings of the country. The third and the most important suggestion has reference to the disposal of the funds available in the savings banks. Under the existing system, for all practical purposes, the savings of the people lie dormant in the State treasury, while agriculture and other industries cannot hope to get capital except at ruinous rates. Though Government deserve every praise for the assistance they are rendering to the Co-operative Credit Movement, whose main object is to supply capital to needy agriculturists, they have, in effect, 'allowed the loanable capital of the country to be diverted from its legitimate direction, *viz.*, being employed to stimulate industrial and agricultural production,' by letting the savings banks deposits lie in the State treasury. Government must therefore recognize that the surplus capital of the country as represented in the savings banks, so far from being merged in the general balance of the Treasury, should be made available to the solvent needy as loans, whether for extinguishing or reducing indebtedness or for investments in reproductive ways. It is needless to add that the changes and improvements above described deserve careful and sympathic consideration at the hands of Government.

Special Articles.

INDIA AND ECONOMIC CRISES.

By M. BALKRISHNA, M.A., F.R.S.S., *Professor of Economics, Gurukula University.*

I

CRISES have been variously denominated monetary, financial, commercial, industrial or credit crises. These designations are most useful to indicate the causes or characteristics of individual panics but are not comprehensive enough to cover the whole subject. They are, indeed, only different phases of what may properly be termed Economic Crises.

Frederick Engels has given the best description of an industrial cycle culminating in a crisis. "The whole industrial and commercial world, production and exchange among all civilized peoples and their more or less barbaric hangers-on *are thrown out of joint about once every ten years.* Commerce is at a standstill, the markets are glutted, products accumulate, as multitudinous as they are unsaleable, hard cash disappears, credit vanishes, factories are closed, the mass of workmen are in want of the means of subsistence, because they have produced too much of the means of subsistence, bankruptcy follows upon bankruptcy, execution upon execution. The stagnation lasts for years, productive forces and products are wasted and destroyed wholesale, until the accumulated mass of commodities finally filters off, more or less depreciated in value, until production and exchange gradually begin to move again. Little by little the pace quickens. It becomes a trot. The industrial trot breaks into a canter, the canter in turn grows into a headlong gallop of a perfect steeple-chase of industry, commercial credit and speculation which finally after breakneck leaps, ends where it began—

in the ditch of a crisis. And so over and over again."

Lord Overstone thus described the various steps of a credit cycle: 'State of quiescence, improvement, growing confidence, prosperity, excitement, overtrading, convulsions, pressure, stagnation, distress, ending again in quiescence.'

II

IMPORTANCE OF THE TOPIC OF CRISES TO INDIA.

(1) India is practically a new country in modern industry and foreign trade. It has been seen that crises are more severe and frequent in the United States than in any other country while they are felt in progressively diminishing force in the industrially old countries like England, Germany, France, Holland and Switzerland. They are a comparatively modern growth because they have come in company with industrial freedom and individualism, with the factory system, the extension of foreign trade, the use of credit and many other features which mark the economic life of this century. As India is advancing in the footsteps of the West, it shall have to go through the same throes and agonies which characterise crises elsewhere, if she does not take sufficient precautions to avoid them before hand.

(2) The course of foreign commerce is usually recognized as less stable and less reliable than that of home trade, because the growth of international commerce opens the trade of a country to many new disturbing influences. In the case of India, the truth of this statement is fully borne out by the lamentable disturbances in Indian trade, external as well as internal—caused by the currency changes, depreciation of silver, appreciation of gold, disappearance of bimetallism, acceptance of monometallism by the outside world during the years 1870 and 1895.

Then, agriculture and all extractive industries are less susceptible to injury than are manuture and commerce, because the goods which they produce are in the least possible degree specialized. Moreover, capital invested in agriculture is not so rapidly impaired while lying idle as is capital invested in manufacturing and commercial enterprises. Three-fourths of the population of India are agriculturists and hence no commercial, industrial or credit crises can happen here (sec. IV, 8. 9). But now that India is impatiently inviting industry with its iron-giants, she shall have to be subject to their cruelly tearing claws.

(3) Everybody knows that credit rests upon one man's belief in the ability and willingness of another to meet his obligations. Creditors believe that debtors would honestly repay their debts. *Credit has been called a great teacher and the discipline of commerce is truly a civilizing force. Crises may be looked upon as chastisement for mistakes and bad faith.* India has too much of it. Without honesty we might raise stupendous structures in the business world but they would be too lofty for the basis of integrity. A higher standard of morality, honesty, credit and a stronger unified public opinion are needed for India, otherwise commercial structures would soon collapse to India's detriment.

(4) The precipitation and ready disappearance of crises leaving only a few marks of the wreckage depend upon the mental stability, moral capacities and the commercial knowledge of a people. *Indians are far behind in these requisites of the equlibrium of trade.* Hence, the study of the causes of crises, their evils and remedies is particularly important for every Indian.

(5) There is also a fifth reason why India should pay special attention to them. *Men often suffer for the sins of others.* The truth of this assertion is fully revealed in the case of international or world crises. So much has the world been drawn into economic interdependence that any sudden dislocation of industry in one part of the world, say in the United States (as in 1907), causes convulsions in India. *It is not sufficient that we should ably manage our own house, but we have to look to the solidity of the walls of our neighbours.*

III

SYMPTOMS OF A CRISIS.

It is always true that coming events cast their shadows before. So the coming of a crisis can be certainly predicted from such prominent events as are sketched below :

(1) Abnormal activity in floating enterprises and boldness in speculation.

(2) Unusual activity in stock jobbing.

(3) Unusual excitement and gullibility of the public caused by the report of large profits.

(4) Rapid increase of luxury.

(5) Sharp rise of the price of necessaries, articles of luxury, raw materials and provisions.

(6) Rise in the price of real estate.

(7) Strong demand for labour and the rise in wages.

(8) Industrial expansion of credit and credit instrumentalities, and consequent rapid and unusual increase in discount.

(9) Large demand for cash and in consequence of this demand, a decline in stocks.

However when a panic begins, the organized industry becomes disorganized. That period is characterized by a terrible scarcity of bank credit, suspension of cash payments, unusual rise in the rate of discount, disappearance of hard cash because of the increase of hoards, sudden drop in prices and then in wages, accumulation of overproducts, closing of factories and workshops, lack of employment for the wage-earner, bankruptcies, liquidations and many other kindred symptoms. The following statistics of bankruptcies during some remarkable crises would throw much light on the melancholy consequences brought about by these economic diseases.

REMARKABLE CRISES. *

1763. Amsterdam, originating with the house of Neufville. Failures—20 in Holland, 20 in England, 37 in Hamburg.

1773. Failures in Holland exceeding 10 millions.

1799. Hamburg, 82 failures, 2 millions.

1814. England, 240 banks suspended.

1825. Manchester, failures 2 millions.

1831. *Calcutta*, failures 15 millions.

1837. United States, all banks closed.

1847. England, failures 20 millions *discount* 13 *per cent.*

1857. United States, 7,200 houses failed for 111 millions.

1866. London, Overend—Gurney ; failures 100 millions.

* *Mulhall's Dictionary of Statistics*, p. 89.

IV

CAUSES OF CRISES.

There are two groups of causes ; of the first group are those as to whose occurrence no law can be formulated. In the second group, we may mention those explanations of crises pointing out an inherent tendency of industry which, when not counteracted leads to recurring periods of distress.

Accidental causes of the first group are numerous, but some of them are briefly discussed below.

(1) *Inventions.*–Mightily change. The proportions in which the factors of production are related to one another in industry, readjust industries to one another in the scale of importance and alter the territorial relations of producing areas. They are coming more and more now to destroy large amounts of fixed capital which have been invested to utilize previous inventive achievements. The invention of the steam engine, spinning, weaving and ginning machines and the discovery of the Bessemer process of steel-making are a few of the numerous examples under this head.

(2) *New means of communication.*–The Europeon markets were convulsed by the opening of the Suez Canal as they shall be by the Panama Canal. Optimism and the love of stimulating news serve generally to exaggerate the importance of an unknown demand. One has to recall the 'Mississippi Scheme' of 1718 and 1719 and the 'South Sea Bubble' of 1720 in confirmation of this. Over-estimation of the markets of Brazil and of Spanish America contributed principally to the distress in England in 1810. In 1824 and 1825, the markets of Peru and Mexico were over-estimated and in 1843 those of China were likewise.

(3) *The laying of import duties.*-This offers a prolific cause of uncertainty in trade with new markets. In connection with crises the unstability and artificiality of tariffs is the chief subject of remark. History tells us that the various changes from low to high and high to low tariff between 1832 and 1880 in America led to periods of undue inflation, great demoralization, prosperity and depression. The mere suggestion of possible action is sufficient to stir the commercial world and to produce alarm and even serious disturbance in trade. For instance, the levy of ten per cent. duty on imported silver by the Indian Government in order to artificially enhance the value of the depreciated silver of the country and the suggestion of an English paper that the same duty might also be levied on the importation of gold into India so that the unprecedented absorption of the yellow metal may be effectively checked, created sufficient stir in the commercial world.

(4) *Modern monopolies, corners, trusts, syndicates and pools.*—These are great factors in today's industry. Their wars, the wars of the giants of industrialism, are full of deep consequences to the whole industrial world.

(5) *Changes in the value of gold and silver.*—The crises of1857 in England was mainly caused by the great importation of gold and silver, consequent upon the discovery of the Californian fields. The crisis of 1893 in the United States was in part, due to the distrust of the currency of the country. The Indian crisis of the same year can be partially attributed to the same cause and partially to the failure of crops. Mr. Frewen of 'the Economic Crises' sees in the demonetization and the appreciation of gold the cause of many crises.

(6) *Changes in fashion.*—Demand influenced by general education and the quickening of intellectual movements and encouraged to nicety by the great variety of goods available to choose from, is becoming more uncertain and more subject to whims and fads than ever before. The larger the income the larger the disposable surplus set free to form an unpredictable demand. Production, on the contrary, employing machinery and a strictly classified labour personnel under a complete system of organization pours forth vast quantity of goods of which each unit exactly resembles the other.

(7) *Wars and revolutions.*—These operate powerfully to restrain certain kinds of consumption and to increase other kinds. Not also does war disturb the course of industry of the nations engaged in it, but of many others as well.

(8) (i) Failure of a staple crop as of wheat, rice or cotton, (ii) collapse of a mining excitement, (iii) puncture of the bubble of overcapitalization of joint-stock concerns, (iv) derangement of some one trade, (v) disastrous collapse of some one great individual concern, (vi) various kinds of new laws concerning banking, bankruptcy and corporations can also be named as accidental causes of crises.

Misuse of credit, over production and variation of solar heat may be mentioned as the three important and inherently fixed causes of recurring panics.

(9) It has already been pointed out that the chief characteristic of the pre-crisis period is the abnormal extension of credit while a crisis itself culminates in an abnormal contraction of loans. Hence great stress has been laid on the misuse of credit as the inherent cause of crises. (i) Undue extension of credit, (ii) mismanagement of loans and reserves, (iii) the unlocking of hoards, (iv) the after-effects of great gold and silver discoveries, (v) non-elasticity of currency, (vi) the lack of free-trade in the issue and management of currency as in India by means of closing the mints to the public and the inflation or contraction of money at the sweet will of the Finance Minister are some of the causes under this head.

(10) Some economists allege that overproduction or underconsumption is inherently fixed in the modern industrial system and consequently so long as the socialistic system of nationalized production is not introduced, crises would be ever recurring. There is much truth in this assertion. In these days, production and consumption cannot be co-ordi-

nated, for the widened market is subject to mighty disturbances from many causes: freedom and individuality of sellers and buyers makes demand uncertain, weakens custom, develops wholesale and retail agencies which hide producers and consumers from one another, in short, makes the whole industry resemble a mob wherein every unit is completely swayed by self-interest. In such a haphazard and reckless system of production where no law of 'definite proportions' is to be met with, there is no wonder if anarchy should now and then prevail in the industrial world. However, the wonder of wonders to an ordinary mind is that this chaos should result from abundance and Economic Liberty!

It is my belief that the use of electricity as the motive power of machines and the spread of general and technical education would favour the growth of small or cottage industry even in the West. Then with all the freedom of production and consumption, a general glut of commodities or the non-co-ordination of the factors of production would be impossible. In one way it is a good thing that we are only just entering into the industrial sphere. We can take advantage of the abundant experience of all the industrial nations. We can easily escape all the blunders ignorantly committed by those peoples. Their stereoetyped and crystallized systems are hard to change because they involve the destruction of much hard-earned capital, but even then they are fast changing those systems. *India should, from the beginning, adopt the small-industry system exclusively using electricity as the motive power.* Then an excess of production in one direction and dearth in another would be impossible and so far as this cause is concerned, India would get immunity from crises.

V

SUN-SPOT CYCLES—THE CAUSE OF CRISES.

There is a general tendency in the minds of investigators towards well-rounded and neatly sub-divided portions of any study which group the facts into easily comprehended and apparently, final relations. This tendency has been beneficially extended to the very important case of crises too. It is really a pity that attention proportionate to the importance of the subject has not been devoted by economists, either because of the impossibility of the formation of the law of the recurrence of crises or of the inability to comprehend such an absruse subject. However, formation of a law, if any, would save mankind from the thousand and one ills which follow in the wake of panics with the same regularity and constancy as night follows the day. It is extremely important for the business man, the banker, the broker, the entrepreneur, the wage-earner, the capitalist, the agriculturist and the middleman and over and above all for the governments of various countries and all to know the methods of forecasting business conditions, to predict the coming catastrophe, divine the extent of the ravages necessarily to be committed by it and then seek out the means, if possible, to escape those impending calamities.

Stanley Jevons is the most renowned pioneer in this hidden sphere. He saw that crises in England, in the majority of cases, periodically occurred after every ten years, as in 1810, 1815, 1825, 1836-39, 1847, 1857, 1866, 1873-76, 1890. This periodicity has been shown to occur from the period of 1710 also. Jevons was in search of some important cause of such a wonderfully regular variation. The contemporary astronomers had concluded that sun-spot cycle recurred after every ten years. In a few cases the periodicity of crises coincided with the periodic variation in the frequency of solar-spots. At the sight of such a striking coincidence, Jevons presumed the existence of a causal relation between the two phenomena. In short, his is the theory that, because maximum sun-spots indicate a greater activity upon the surface of the sun than exists at periods of minimum spots, this varying solar activity influences crops and hence are to be seen lean and fat years in India, England and elsewhere. In his political economy, he has thus expressed himself on this point. "Good vintage years on the continent of Europe, and

droughts in India, recur every ten or eleven years, and it seems probable that commercial crises are connected with a periodic variation of weather affecting all parts of the earth and *probably arising from increased waves of heat received from the sun at average intervals of ten years and a fraction ?"*

This theory makes the recurrence of crises uncontrollable by man. He must submit to their evils and without any hope of escape from their iron clutches. Although the truth of this *fatalistic theory* has not been scientifically established, yet many economists have clung to it as if it were a scientific law. The reasons for not accepting this sun-spot theory are briefly given below :

(*a*) The sun-spot period is not about ten years but nearly twelve years.

(*b*) Present science has not found any meteorological significance in this phenomenon.

(*c*) There is no proof that sun-spots exert an important determinative influence upon climate in the face of so many terrestrial climatic variations.

(*d*) There is no relation in bumper and short crops and crises in the Western world.

(*e*) Periodicity of spots and crises does not at all coincide in time. From the year 1870 this periodicity is said to have been broken in the Western world.

(*f*) It is simply absurd to believe that there can be only one simple cause of such a complex phenomenon as that of panics, that shortage or failure of crops alone can be an exclusive cause of this periodicity. We cannot ignore the voluntary and free human element which is the most potent cause of all ills and panacias. We ought not to ignore the importance of politics, banking conditions and foreign commerce in bringing about these cycles of depression and prosperity.

With all the objections to the sun-spot theory as explaining the causes of the periodicity of panics, the periodicity itself remains a solid fact. To corroborate the statement as to periodic recurrence, I shall place before the reader some facts from Indian history. It is a wonderful fact that in the Punjab and even in the whole of India crops failed nearly after every ten years. The regular ups and downs in prices seem to obey an important cast iron rules, some subtle cause which mortal man with all the equipments of science has miserably failed to divine. Although local famines of great virulence twice (1866, 1893) occurred in the last fifty years, yet the evidence of the ten years' periodicity of the depression of agriculture and trade in the Punjab is unmistakable in the tables given below:—

Table I.—Wheat.

1860.	**1861.**	1862.	1868.	**1869.**	1870.
30 seers per Rupee.	17½ s.	25s.	18	14½	16 (21s. next year),
1877	**1878-9**	1880	1886	**1887**	1888
23½	14-12	12½(17s. in 1881)	18	16	18 (22s. in 1889)
1896	**'97-8**	1899	1907	**1908-9**	1910
18½	10	19	14	9½	13½

Table II.—Gram.

1860.	**1861.**	1862.	1868.	**1869.**	1870.
41 seers per rupee.	20½	29½	20½	11½	17
1877	**1878-9**	1880	1886	**1887**	1888
29½	16-14½	16 (20 in 1881)	25	23½	22½
1896	**1897-8**	1899	1907	**1908-9**	1900
23	10½	23½	17	10-15	20

Table III.—Rice.

1860.	**1861.**	1862.	1868.	**1869.**	1870.
13½	12	14	10	8½	10½
1877	**1878-9**	1880	1886	**1887**	1888
8½	5-6½	6	11	10½	10½
96	**97-8**	99	1907	**1908-9**	1910
11	8	11½	7	7	8

Table IV—Sugar.

1860.	**1861.**	1862.	1867.	**1868-9**	1870.
12½ Seers per Rupee.	10½	12	10	6½-8	10
1877	**1878-9**	1880	1886	**1887**	1888
6½	7-6	6	7½	10	12½
1896	**1897-8**	1899	1907	**1908**	1909-10
11½	11-9	10½	8	7½	7-9

Table V—Millet.

1860	1861.	1862.	1868	1869.	1870.
35	25	31½	24	18	20½ (27s. N. Year.)
1877	1878-9	1880	1886	1887	1888
39	20-17	19 (25s. N. Year.)	22	17	18 (25s. N. Year.)
1896	1897-8	1899	1907	1908-9	1910
20	10½-14	22½	18	12-16½	17

Table VI—Barley.

1860.	1861.	1862.	1868	1869.	1870.
50 seers per rupee.	30-28	37½	26	19½	22 (28½ s. N. Year.)
1877	1878-9	1880	1886	1887-8	1889
35	25-18½	18½ (27s. N. Year.)	28	25	31
1896	97-8	1899	1907	1908-9	1910
25	12½	33	21½	13-17	22

The above tables have shown us that the famine years in the Punjab from 1860 were 1861, 1869, 1879, 1887, 1897-98 and 1908. This is a periodic variation of nearly ten years. Why should there be such a regularity in she recurrence of severe famines? Stranger ttill, there is the same rhythmic rise and fall in the prices of food grains all over India during the years named above.

Special Index Number of prices in India for food-grains during the last 50 years, showing Recurring Crises after nearly ten years.(*a*)

1860.	1861.	1862.	1868.	1869.	1870.
...	97(*b*)	81	116	149	123
1877	1878-9	1880	1887	1888	1889
144	174-160	118	117	123	119
1896	97-8	1899	1907	1908	1909
155	209-139	137	180	231	195

I am unable to find out any cause or causes of this constant and regular recurrence of severe famines after every ten years, but shall be very glad if any gentleman would throw light on this point.

(*a*) Variations. In Indian Price Levels from 1861 to 1809, p. 16.

(*b*) A quantity of seven food grains which cost us say Rs. 97 in 1861, could be got at Rs. 81, in 1862 so much and so suddenly had the price fallen in one year!

VI

SOCIAL EVILS OF CRISES.

The numerous evils immediate and ultimate inherent in crises must have been clearly seen in the descriptive definitions and in the manifold causes given above. A few more important social ills still remain to be deduced from the actual operation of crises. We cannot do better than close this article by briefly mentioning them here.

(1) Crises promote rather than diminish inequalities in the distribution of wealth, for in the extremity of the man of ordinary means lies the opportunity of men of very large wealth.

(2) Anything which increases the uncertainty of business tends to break down habits of thrift. Crises teach to many persons the fatal secret that they can live without work, because during crises they have lived upon the charity of others.

(3) Uncertain business conditions favour the growth of the captain of industry.

(4) A diseased social organism like that of India would severely suffer from the evils of a crisis though a sound organisim like that of England may not be greatly injured.

(5) A marked increase in certain kinds of crime occurs during a crisis.

(6) Women and children are more employed on account of the decline of wages and factory acts are avoided.

(7) Unemployment, the father of all discontent and crime and misplacement of labour is increased.

(8) Strikes, lockouts and industrial disputes become the order of the day.

(9) All sorts of industrial experiments such as co-operation, productive and distributive, profit-sharing, sliding scale, etc., suffer distress.

(10) Lastly, economic questions are dragged into the mire of party faction & hasty legislation

These evils can not surely be removed in a day but their extinguishment will come through the general moral and economic evolution and especially the former. Hence, every effort should be made to elevate the moral and economic position of the masses of India, that they may with courage face those economic diseases called crises and, if possible, get immunity even from their impending ills through their foresight and forecast of future business conditions.

THE IMPROVEMENT OF INDIAN AGRICULTURE.

BY DR. N. KUNJAN PILLAI, M.A., B.SC., PH.D., *Director of Agriculture, Travancore.*

[The first two articles appeared in the March and April issues of the *Wealth of India*— Ed., W. I.]

III

I have so far touched upon the different operations that come under general agriculture and pointed out what improvements can be introduced into them. There is yet to be considered how these improvements are to be introduced. The first step necessary for carrying out this work is the establishment of permanent experimental stations. Each country has its own agricultural problems to deal with, and these have to be specially enquired into. We can no doubt take advantage of much of the general knowledge that has been obtained at the numerous experimental stations in Europe and America; but our local conditions present certain difficulties which we have to solve for ourselves. Experimental work should as far as possible be specialised. It is a mistake to attempt experiments with several crops in one station. Far better work can be turned up by devoting one station to each of the important crops, such as paddy, cocoanut, pepper etc. These stations are meant only for the conduct of field experiments i.e., for working out such problems as the advantages of different forms of tillage, the ecomomic system of manuring, the improvement of native plants, the introduction of exotic crops, and so forth. There are however certain other problems which can be investigated only in the laboratory, such for instance as the study of insect pests and diseases, the determination of the food value of different kinds of produce, the analysis of soils etc. To carry on such work, there must be laboratories and specialists in agricultural chemistry, entomology, mycology and other allied subjects.

Along with the establishment of experimental stations and agricultural laboratories, measures must be devised to bring the knowledge that is now available within the reach of the ryots. The gravest accusation that the practical farmer makes against the agricultural expert is that he is a theorist and that his ideas not being based on facts of experience are rather impracticable. The scientist no doubt does a certain amount of theorising; but he forms his theories by careful and exhaustive examination of facts, by accurate and well planned experiments. In the course of the experiments, he may meet with failures and may commit mistakes; but if one of his many experiments proves successful, he will be amply rewarded for his labours. The results of the successful experiments conducted by scientists must be brought within the reach of the ryots in order that they may apply them in actual practice.

There are various methods of conveying knowledge to the farmer. None is more successful than that of practical demonstration in the field. The farmer who has been brought up in the idea that the system of cultivation which he has inherited unchanged from his forefathers is the best will not give much credence to what he may hear at a lecture or read in a book. Show to him by actual demonstration that his system of cultivation can be improved. he will at once grasp the idea and stick to it for ever. One point that has to be specially borne in mind is that demonstration and experiments should not be mixed up. They should be kept separate and if possible the farmer must not be given access to the experimental plots. He is unable to distinguish between demonstration and experiment, and if he sees the failure of an experiment—such failures are common and unavoidable—he will rush to the conclusion that scientific agriculture is quite useless. The best way of conducting demonstration is to have it carried out in the farmers' lands which should be rented out for the purpose, the place of operation being changed from time to time. I have myself followed this system in Travancore and found it work quite satisfactorily.

Besides demonstration, other methods such as holding exhibitions, delivering lectures, publishing leaflets and journals on agricultural topics must also be resorted to for spreading

new ideas among the farmers. There is a class of people who think that exhibitions and shows are not of much good. I must confess that I am not one of those. I had occasion to see many exhibitions conducted on a very large scale both in India and in Europe, and I am strongly of opinion that they wield immense educative power.

Demonstration, exhibitions, lectures, leaflets and journals are all means of getting at the present generation of farmers. More important than this is the question of influencing the future generations. This can be done only by establishing a sound system of agricultural education. If agricultural knowledge is imparted to the boys, they will grow up with an open mind ready to assimilate new ideas and fresh knowledge, and will turn out successful scientific farmers of the future. Agricultural education is everywhere looked upon as the most potent factor in the introduction of permanent improv ements in agriculture. Take what country you like whether it be England, Germany, the United States or Japan, everywhere you find that agricultural education receives prominent attention from the Government and the people.

In India this question does receive some attention but not as much as it ought to. Education in a country must always be such as would fit the boys for the service which will be demanded of them in after-life. In a country like India where the large majority of the people are dependent directly or indirectly upon agriculture, education should as far as possible have an agricultural trend. For a long time, this aspect of our educational problem has not been considered at all, and the result is that a universal mania has been created among the people to look upon Government service as the be-all and end-all of their life. Many young men who would have quietly and willingly followed the vocation of their ancestors are now left without employment as they think it as disgrace to follow their ancestral profession. The problem of the unemployed, though not very serious at present, is likely to assume formidable dimensions if left unsolved at this early stage.

It is not possible for me to enter into the discussion, on this occasion, of the different methods of agricultural education, and point out the one that is best suited to this country. I shall however content myself with saying that agricultural education should be begun as early as practicable in the career of students, and that it should be conducted in such a way as to attract the sons of real farmers whose intention is to apply the knowledge they gain in actual practice and not men whose object is to secure a lucrative billet in Government service.

The last point I wish to touch upon in this paper is the question of co-operation. Without co-operation, it is not possible to introduce substantial improvements into agriculture or for that matter into any industry. It is chiefly co-operation that has made the agriculturists of England, Germany and other countries what they are at present. The little State of Denmark has in the course of the nineteenth century made a mark in the commercial world with her creameries and butter factories. The extraordinary development of the butter industry in Denmark to such an extent as to beat even large countries like Great Britain is due to co-operation and co-operation alone.

Co-operative societies are now common all over Europe and America. They are not confined to dairying as in Denmark, but have been extended to other branches as well, such as the purchase of implements and machines, the sale of agricultural produce, the establishment of credit banks, and so forth. Credit banks have done immense good to the farmers wherever they have been established. They have saved them from the clutches of money lenders by lending them money under light conditions whenever they stand in need of it for agricultural improvements. How beneficial such banks will be to Indian farmers need not be told here. Hardly a single season passes in these days without a complete or partial failure of crops, and when surrounded by famine, the poor cultivator has to fall back upon the money lenders for help. He is thus ever sailing between Scylla and Charybdis from which dangerous position credit banks alone will be able to save them. Co-operative credit societies have now been started in almost all the provinces in India, and everywhere they are working with considerable success. In the States of Travancore and Cochin such societies have not yet been established. Let us hope that this defect will soon be remedied. The initiative in this case has to be taken by the respective Governments, but it does not mean that the people themselves should remain idle till the Government comes forward to lead them. There is a great deal that the people can do and if they are bold enough to take the initiative, the Government will naturally follow them and render them substantial help. Let the people of Travancore and Cochin wake up and do what they can without trusting too much to fate and leaving everything to their Governments.

The Agricultural World.

White Ants.

Mr. C. P. Perry writing in the *Queensland Agricultural Journal* for June says that even white ants have their uses. Their nests make valuable mortar, which, when properly mixed, makes splendid floors, etc.; but Mr. Perry has found another use for them. When burning off old logs or stumps he discovered that if the nests are broken up with a pick and well packed around the fire, when properly burned, they resemble broken bricks. When cold, if a couple of cwt. or so is spread under each fruit tree, the effect on the growth of them is marvellous.

Bud-rot Disease.

Writing in the *Journal of the Jamaica Agricultural Society*, Mr. L. A. Wates states that the bud-rot disease of the cocoanut can be cured if taken under the right conditions and at a sufficiently early stage. The stage, he says, is the beginning of the shrinking of the centre upright limb. The cure which has been found to be successful has been to cut out altogether the affected part, and to keep cutting back the diseased part until perfectly clean tissue is seen. The cabbage is then soaked in Bordeaux mixture. The resulting appearance of the cocoanut is a healthy natural tree with fruit on, but minus its heart leaves. Within a month, Mr. Wates states, the heart will have pushed out a piece of growth nearly three feet high, and after twelve months the tree will have a splendid healthy fresh plume of leaves.

Bacteria and Milk.

Experiments were carried out with the herd of the Edinburgh District Lunacy Board at Bangour Village Farm to obtain information on the various factors which influence the bacterial content of milk, with a view to the fixing of a bacterial standard for clean milk and to demonstrate the more important sources of bacterial contamination together with the methods of avoiding them. Contamination of the milk in the byre has already been shown to be the most important, and the inquiry was limited as above, contamination during transit not being dealt with.

Effect of Grooming Cows.

The cows were groomed an hour before the the evening milking, and the number of bacteria in the milk was found to average 2,464 per c. c., compared with 9,827 per c. c. at the morning milking, which was fourteen hours after the grooming. With cows that were never groomed, however, the number of bacteria was over 125,000 per c. c. There was therefore a reduction of 98 per cent, in the total contamination as the result of grooming.

Effect of Brushing the Udders.

Brushing the udders of the cows immediately before milking, in addition to the ordinary grooming, was found to increase the bacterial content of the milk greatly. When the brushing was done three-quarters of an hour before milking there was still no advantage from the brushing. This method of treating the udder is therefore unsatisfactory, owing, no doubt, to the dirt particles on the udder being loosened so that when milking begins they fall into the milkpail.

Effect of Washing the Udders.

When the udders were washed with soap and water and left moist, a large reduction, was effected in the number of bacteria. The average number in samples of the milk of four cows treated in this way was only 1,125 per c.c.

Bacteria in the Air.

Foddering and grooming the cows, and the removal of manure from the byre during milking increased the number of bacteria in the air considerably.

THE KEEPING OF MILK.

Cooling the milk immediately after milking resulted, as was to be expected, in a smaller number of bacteria than when it was allowed to cool naturally. For example, two samples of milk, one of which was cooled immediately after milking to 50° F., and the other allowed to cool in the air to 64° F., showed a vast difference in the bacterial content. The samples were kept approximately at the above temperatures for twenty-four hours, and at the end of that time they contained respectively 128,000 and 874,000 bacteria per c.c.

A large number of samples of the mixed milk of the herd at Bangour were taken as the milk left the byre, and the average number of bacteria found in them was about 47,900 per c. c. In a number of milks from town dairies which were also examined the average was about twice as high. The following recommendations for clean milk, based on the experiments, are given :—

(1) The fore milk should be rejected.

(2) The cows should be groomed daily, and their udders should be washed before milking.

(3) Foddering with dusty fodder, removal of manure, and all operations which raise dust and so increase the bacterial content of the air of the byre, should be done after milking, or several hours before.

(4) The byre should be cleaned twice daily and the floor flushed with water before milking.

(5) The ventilation and the lighting of the byre should be efficient.

(6) The milkers should wear clean overalls during milking, and should wash their hands at the commencement of milking, and also after the milking of each cow.

(7) The milk should not be allowed to stand exposed to the air of the byre after milking. It should be removed to a cool, clean dairy, where it should be immediately cooled to 8O° C. (50° F.), and kept cool.

(8) All milk vessels, &c., should be thoroughly sterilised with live steam, and should not be allowed to stand in the byre before milking begins. They should not be rinsed with cold water or wiped with a cloth after steaming, but simply set up to drain.

(9) The use of unclean cloths is a frequent source of bacterial contamination and should be carefully avoided.

Indigo in Madras.

Baron Schrotky de Schrottzynski, in the course of a letter to the Honorary Secretaries, Central Agricultural Committee, Madras, writes :—

I know of no reason why the cultivation of *Indigoferra arrecta* should not be successful in Madras, if the experience acquired elsewhere is fully taken advantage of. It took fully four years before planters in Behar learnt how best to grow this indigo, but the experience gained there has enabled its successful introduction into the dry districts of Gorakhpur, into Ceylon and Singapore. It is a hardier plant than either *Indigoferra tinctoria* or *Sumatrana*, excepting in the very earliest stages of its growth, and it withstands long periods of drought better than either of these latter. Your District Associations should take the matter in hand and grow an acre or so in every one of the Madras indigo districts. It must be a surface sowing, and December-January would be a good time for sowing.

I am, however, of opinion that, even with the cultivation of the ordinary varieties of indigo, especially of the Nandyal plant, there is every prospect of indigo manufacture in Madras becoming once more a profitable undertaking, if better methods of manufacture are adopted and the dye marketed in the form of a paste. Factories are still in existence, and the labour and supervising native staff have not yet forgotten what they learnt from their fathers. The ryots would gladly resume indigo cultivation, if they could get for their crop again what was paid in 1894, for they have learnt to appreciate the great manurial value of the *seet*, or indigo refuse. Your Committee, doubtless, appreciates the great benefit which would result from a successful revival of the indigo industry in Madras, and from raising indigo cultivation from 60,000 acres, at which it is now, again to over 500,000

acres, which it was 18 years ago. With the new methods of manufacture a return of dye of the gross value of Rs. 120 per acre, can be obtained, while the manurial value of the residue, the *seet*, obtained from an acre under indigo, cannot be put down at less than Rs. 90. Indigo can therefore become once more a valuable crop ; it is a plant which does not exhaust the soil, for it draws its nourishment from strata not reached by ordinary crops, it requires no manure and is one of the plants which enrich the soil, a fact that is well known.

Indigo harvest and manufacture give employment to agricultural labour at a time when there is little demand for it and for all these reasons there is no other staple product that has as much to recommend it.

I need not refer at any length to the causes which have reduced the cultivation of the indigo plant in Madras from 500,000 to 60,000 acres. They are well-known. The competition of a synthetic dye has reduced prices to a level at which it does not pay to produce natural indigo on the old basis. One hundred and twenty bundles of green plant (each bundle weighing 100, 120 lbs.), or say 12,000 lbs. can be produced in two cuttings from an acre of land in Madras. This fills a steeping vat of 1,000 cubic feet content, and the outturn therefrom is, on an average, 25 lbs. of indigo costing Rs. 25 to manufacture, and selling at about Rs. 25 to Rs. 32, according to quality. The margin of profit to the manufacturer is therefore very small under the best circumstances, and but for the great value of the *seet*, no indigo at all would be grown in Madras. With new methods of manufacture and marketing the dye as a paste, very different results can be obtained. The outturn in Ceylon from 100 lbs. green plant has been 3 lbs. of a 20 per cent. standard indigo paste, the value of the paste being As. 8 per lb. Estimating the outturn in Madras at only 2 lbs. of standard paste per 100 lbs. green plant, the outturn from 12,000 lbs. plant can safely be taken at not less than 240 lbs. of standard paste, value Rs. 120.

The Vitality of Wheat.

Mr. R. Whymper concludes his articles on the vitality of wheat in the April number of "*Knowledge*," and summarises his results as follows:—

The suggestion that the vitality of wheat or of any seeds, depends upon the degree and rapidity of desiccation and the thickness of the integument is strongly confirmed ; and the loss of moisture, either if too rapid or extended over too great a period of time, would tend to render the protective coating of the seed pervious at a rate more or less rapid according to the efficiency of the integument. On the other hand, the cause of the loss of vitality of wheat in ten years, which is the period recently given by Carruthers and previously by others, must be examined more closely, for neither chemical nor microscopical examination shows that there is sufficient reason for the loss of vitality on these grounds alone in so short a time.

For this reason a number of experiments, covering a wide range of environmental conditions, has been undertaken.

The experimental tubes, which have been prepared in triplicate, will be examined in ten years' time, and later at periods of ten years' interval if the first results should justify such a procedure.

A New Method of Fertilizing the Soil.

A new method of applying chemical fertilizer to fruit trees is proposed by M. Cadoret, and he finds that it gives much better results in experiments which he has been making in France. The usual method is to simply spread or strew the chemical fertilizer on the ground at a certain distance around the trunk of the tree, but it is found that this has a disadvantage in that the fertilizing principles do not penetrate into the ground as rapidly as might be supposed, so that their action is felt but slowly. M. Cadoret finds that a much better plan is to use an iron rod having an expanded part near the point so as to make rather large holes in the ground. Such holes are filled with the fertilizer which consists of a properly prepared mixture. using some pre-

cautions. The fertilizer, in order to prevent damage to the roots from the caustic action, should be mixed with crumbled earth beforehand. From four to six holes should be used, deep enough so as to contain all the fertilizer required for the tree in question, and the holes are best placed about 12 inches from the trunk. The depth of the holes is increased to keep pace with the growth of the tree. According to M. Cadoret, the above method gives remarkable results, and he finds that peach, apricot, cherry, and other trees of five years' growth are as well developed as other trees of twelve years. The method has the advantage that it does not imply extra cost. Two men can treat eighty trees a day in this way.

Rural Hand Labour and Machinery.

In a communication to the Association of Agricultural Engineers of Louvainby Mr. M. W. Guisset maintains that manual labour in agriculture, is without question of better quality than work done mechanically, were it only because in manual work, the intelligence of the worker always directs the energy he develops, and husbands the strength according to the necessity of the work.

It is also certain, he says, "that manual work results by forming a uniform soil surface in an increased production; a gardener by the careful working of his bed gets results which if he reckoned by acres would represent enormous figures. But the actual cost of hand labour, considered in the light of acres, would not be recouped by the sale of the produce at ordinary market prices.

Consequently, the development of our primary industries compels us to perfect and carry out unceasingly the mechanical working of the land. Thus the present day farmer is obliged to sacrifice the quality of the work in order to realise the great quantity demanded by the improvement of his farm.

He has partially replaced human energy by the cheaper energy of horse-power motors ; then by force of circumstances he has had to substitute inanimate machines from which he demands a thousand times more energy at a still cheaper rate."

Prickly -Pear as Fodder.

In the *Indian Witness* a Madras Missionary gives his experience of the use of the prickly-pear, or thorny cactus, as fodder. During a period of scarcity, due to a succession of dry years between 1891 and 1898, the Madras Government sent out notices in regard to the use of prickly-pear as a forage plant, and the necessary tools for preparing it were supplied at the *taluq* cutcheries, these tools consisting of a knife, a pair of tongs, and some tweezers with which to cut out the thorns. The instructions were to cut out the thorns, cut the leaves into pieces of an inch or so in size, wash them thoroughly, and give them to the cattle with a little bran and salt. By following the instructions, the Rev. N. R. Manley had no difficulty in getting his oxen and milch cow to eat the plant. But, curiously, not a single ryot in the district would have anything to do with it, although Rev Manley during a tour took special pains to demonstrate the value of the prickly-pear. He induced the villagers to come and witness the operation of preparing the stuff for feeding the oxen, but, while they looked on with astonishment, he says, it seemed to be quite sufficient for them to say it was never their custom to feed their cattle in that way. So far as Mr. Manley knew, his cattle suffered no inconvenience whatever from being so fed. The animals had their usual allowance of grain, though, when idle, Mr. Manley says, they needed only the prickly-pear. As he remarks, it seems strange that, in a country where fodder is almost always dear, and where prickly-pear is such a nuisance everywhere, the plant should not be better utilised.

Green Manuring and Germination of Seeds.

In 1911 a southern student at the Wisconsin Agricultural College reported the failure of some ten acres of cotton to germinate, where it had been sown immediately after ploughing under green clover. On the other hand, on a similar field planted with the same seed, but which had not been green manured, normal germination occurred. Professor Hoffmann has accordingly begun a study of the effect of

green manuring upon the germination of seeds subsequently sown. In pot tests in the green house he has incorporated with the soil an amount of green clover corresponding to that applied under field conditions, and has then sown various seeds, in all cases sterilizing one series of pots, while another was allowed to remain in a normal condition.

"It has been found that the decomposition of the clover somehow affects cotton seed, but does not have any material effect on the germination of corn (maize), wheat, and clover. Two experiments conducted with flax have, however, shown a similar detrimental effect to that produced on cotton. The results so far secured indicate that the decomposition of green manures results in the reduction of the oxygen supply and an increase in the carbon dioxide present in the soil atmosphere. It is thought that this change in the gaseous contents of the soil prevents the germination of the cotton and flax seed, which contain a high percentage of oil, and so require more oxygen for germination than such seeds as corn, clover, and wheat."

Rice Plant.

The latest addition to the Botanical series of the *Memoirs of the Department of Agriculture in India* is a monograph on pollination and cross-fertilisation in the common rice plant (*Oryza Sativa*, Linn.) by Mr. G. P. Hector, M.A., B.SC., Economic Botanist, Bengal. In a brief Introductory Note, Mr. Hector explains that during the past two years a large number of varieties of rice, cultivated in the districts of Lower Bengal, have been grown on the Dacca Farm with the object of studying their character in single plant cultures and of ascertaining to what extent, if any, natural cross-fertilization takes place, as a correct estimate of this latter point and of the precautions likely to be necessary to keep varieties pure is an essential preliminary to the work of successfully distributing seed of improved types. The main conclusions to be drawn from the results of the experiments are thus set out by the author :— (1) That in Lower Bengal under favourable conditions cross-fertilization may take place in rice to an extent which may be provisionally estimated at about 4 per cent. (2) That this cross-fertilization takes place wholly through the agency of the wind and would seem to be effective only between flowers of adjacent plants to a radius of a few feet. (3) That as regards certain characters at least, *e.g.*, grain colour, segregation along Mendelian lines appears to take place. (4) That so long as seed of a variety is kept free from accidental mixture there is no risk of contamination from cross-fertilization, but that if seed gets mixed, cross-fertilization will undoubtedly take place between adjacent plants in a plot and to an extent sufficient in a few years time to reduce a variety to a number of splitting types. Hence the imperative necessity of taking every precaution to keep seed of varieties free from accidental mixtures.

Threshing Uncut Grain.

Employing the principle of "taking the thresher to the field instead of taking the field to the thresher," a Kansas inventor has produced a machine that dispenses with cutting the grain at harvest time. The new thresher has been in use for three years, states "*The Technical World Magazine*" (Chicago), but last autumn proved its practicability and usefulness when it threshed from 25 to 30 acres of standing grain in a ten-hour day. The inventor claims that it will reduce the cost of grain harvests from 7*d.* to one penny a bushel.

"The principle of the new-style harvester is not simple. A strong blast of air from a revolving fan is blown against the standing grain and forces it against a toothed cylinder which threshes off the grain, depositing it in a trough, from which it is elevated by an auger to another toothed cylinder, which re-threshes it. The chaff is blown out and the clean grain falls into a sack, or may be carried through a tube to a wagon driven alongside. Four horses pull the thresher over the field, while a small gasoline engine works the machine. Only two men are required—one to drive the horses and the other to tie the sacks of threshed grain and look after the engine."

The inventor calcutates that by a universal use of the new thresher a gross saving of 40 million pounds sterling can be accomplished for the American farmer. This saving will result from dispensing with the many high-priced threshers, doing away with the necessity of cutting the grain and hauling it to the stack and then hauling the threshed straw back to the land. Also there will be a great saving of food for feeding hungry harvest hands, and a further saving in the employment of the straw left standing as a fertiliser. In addition to these items, he states., the waste of land now covered with straw stacks is considerable, a railway official computing that a quarter-of-a-million acres in Kansas alone are annually covered with wheat stacks. When the Baldwin machine comes into general use it will let all this land go back into cultivation, and by leaving the standing straw to be ploughed under will give the land the fertiliser of which it often stands sadly in need.

Agricultural Holdings in England and Wales.

From the Agricultural Statistics for 1912, issued by the Board of Agriculture and Fisheries, it appears that the number of agricultural holdings—*i.e.*, of separate occupations of agricultural land exceeding one acre in extent—in 1913 was in England 374,809 and in Wales 61,077, together 435,886, being an increase of 576 over 1911. The increase was due to holdings of from 5 to 300 acres, which increased by 1301, while small holdings of less than 5 acres and large occupations of over 300 acres decreased in number by 550 and 175 respectively.

Since 1905, 628 of the larger farms (of over 300 acres) have disappeared, being for the most part sub-divided into smaller holdings. During the same period, holdings of 50 to 300 acres have increased by 1,088, holdings of 5 to 50 acres by 2,229 and those of 1 to 5 acres by 624. The number of persons occupying land in England and Wales (so far as these returns may be regarded as representing separate occupations) has increased in the course of seven years by 3,313. It is to be remembered that during that period, the farmed area has diminished by 231,000 acres, involving of necessity the extinction of a large number of holdings. A net increase of the number of holdings into which the dwindling agricultural land is divided is consequently the more significant.

Large farms, nevertheless, still occupy a very considerable portion of the land of the country. About 25 per cent of the total farmed area is divided into farms exceeding 300 acres, while nearly 60 per cent. is taken up by medium farms of 50 to 300 acres. Small holdings of 50 acres and under, though forming about two-thirds of the total number of the occupations, account for little more than 15 per cent. of the agricultural land of the country.

Of the 374,809 holdings in England in 1912, there were 81,884 (21·85 per cent.) of from 1 to 5 acres, 168,038 (44·83 per cent.) of from 5 to 50 acres, 110,657 (29·52 per cent.) of from 50 to 300 acres and 14,230 (3·8 per cent.) of over 300 acres; while in Wales, the numbers were respectively: 10,314 (16·89 per cent.) 32,484 (53·18 per cent.) 17,937 (29·37 per cent.) and 342 (0·56 per cent.)

Seed Potatoes.

Farmers' Bulletin No. 533 of the U.S. Department of Agriculture describes what are good seed potatoes and how to produce then. It is a valuable monograph which those who may be interested in the subject will do well to read and digest. Among other matters to be attended to in seed selection by far the simplest and most promising means of developing high-grade seed potatoes is that of the tuber-unit and hill-selection methods outlined below.

TUBER-UNIT METHOD.

The tuber-unit method, as now generally understood, consists in selecting from the seed bin before planting time a considerable number of the most perfectly shaped tubers of from 6 to 8 ounces in weight. When planted, these tubers are quartered, as dropped, into four as nearly equal parts as possible. This is done by splitting the bud-eye cluster in each direction from seed to stem end of the tuber.

In other words, the tuber is cut through its longitudinal axis. The four pieces of each tuber are dropped consecutively in the row at a distance of from 10 to 12 inches apart in the furrow. All tubers showing discoloration of the flesh or other evidence of disease should be rejected. By allowing an additional spacing between each set of fours, the four plants from each tuber are definitely isolated from adjoining ones and the grower can readily observe any variation in vigor and uniformity between the various units planted. This method also enables him to detect any mixtures that may occur in the variety. All mixtures should at once be removed. By marking those which appear to be most uniform in size, vigor, and type when the plants are still in vigorous growth, the first step in selection has been accomplished. At digging time the product of each unit is separately harvested and a further selection made from the marked units of all those which most nearly approach the size, shape, and smoothness desired. These selected tubers should be numbered with both field and unit numbers and separately placed in small sacks, preferably cotton or burlap, and stored to await further examination. The final examination should consist of notes on the number and weight of merchantable and unmerchantable tubers and their general conformity in size, shape, and smoothness to the type desired. From each of the units retained, 10 of the best tubers should be selected for the next season's planting.

It is desirable to maintain the study of each selection on the tuber-unit basis the following season, because it permits a more accurate comparison of the behavior of each. The 10 selected tubers from each original unit will give 40 plants for study the second year. All selections which do not produce a reasonably uniform lot of plants should be marked for rejection. At harvest time the progeny of each selection should be kept by itself and the same data recorded as that taken on the crop grown from the original tuber unit. Only the product from such 40 hill rows as meet the most rigid requirements should be retained. The further conduct of the work will consist in the multiplication of the selected strains for field planting and the elimination of weak plants.

HILL-SELECTION METHOD.

The hill-selection method consists in marking the most promising plants during the growing season. At harvesting time, save only those which give greatest promise. Keep the progeny of each hill separate and take the same data as outlined for the tuber-unit. Plant on the tuber-unit basis the following season. For the sake of uniformity a definite number of tubers—5 or more—should be planted from each hill-selection. From this point on, follow the methods given in tuber-unit work.

The conclusions arrived at in the pamphlet may be summarised as follows:—

SOME CONCLUSIONS.

(1) Good seed is a determining factor in the production of maximum crops of potatoes.

(2) Good seed may be obtained by the tuber-unit and hill-selection methods of selection through the elimination of unproductive and weak plants.

(3) Like produces like. If tubers from unproductive or weak plants are used, a similar harvest will be reaped.

(4) All tubers showing marked discoloration of the flesh should be rejected.

(5) Purity of seed stock is an essential quality of good seed. Serious losses are sustained by the grower through mixtures

(6) A more liberal use of seed will generally result in both increased production and profit.

(7) A good storage place is essential in order to insure sound, firm seed at planting time.

(8) The use of high-grade seed would increase the returns from the potato crop of the country by many millions of dollars.

(9) All seed should be treated with formalin before planting.

The Disposal of Farm Produce.

Mr. Herbert Mace writes in the *Agricultural Economist*.—It is a common complaint of some successful producers that they cannot dispose of their produce satisfactorily, while there

are plenty who could easily dispose of more —if they could produce it.

The raising of produce requires ability of quite a different kind to that needed for selling it. There are, no doubt, extreme cases where a successful producer could never be turned into a good seller but a little training in the principles of salesmanship would generally smooth away many of the difficulties encountered in marketing.

One of the errors a small producer frequently falls into is that of sending his stuff wholesale into the big markets. A man who produces on a small scale should sell on a small scale. He must cultivate a market which shows the highest as distinct from the quickest returns. We may, in fact, take it as a general rule that the more a man has to sell, the less trouble need he go to in order to find his market. It pays him to turn over his goods in bulk and go on producing more. But for the small producer, it is very little more trouble to find a buyer who will pay the highest prices. That buyer is, in one word, the consumer, and especially where the produce is of a mixed character, he is the man to whom the small producer should sell direct. On the one hand, the seller will get higher prices and on the other, the consumer will not only buy a trifle cheaper, but will also secure the produce in the freshest possible condition.

The next mistake the producer often makes is that of not attempting to find a market till the produce is ready, and then, finding the market glutted, being obliged to give it away. Is this common sense? A manufacturer who ran his mills night and day to produce stuff he had not even tried to find a market for would be looked upon as a lunatic. It may be urged that there is no certainty about agricultural supplies, but this is only half an excuse. The law of averages applies just as much here as in anything else, and if the agriculturist were not fairly certain of his harvest, he might as well give up. Even manufacturers find themselves unable to supply their goods at times, on account of breakdowns and strikes but that does not prevent them endeavouring all the time to extend their markets. It may be laid down as a sound rule that nothing should prevent the producer endeavouring to find as large a market as possible before he has his produce ready for it. If his supply turns out not to be big enough, there is no harm done, after all.

Another point that may usefully be taken to heart is that of packing. Other things being equal, goods which are sent out tastefully packed have an immense advantage. There is a strong disposition among the class I am dealing with to imagine that so long as the stuff is right nothing else matters. Any jeweller would tell you that a first rate diamond would, if put in a bad setting, be out of court against an inferior one set to best advantage, and the only merit many well known manufacturers have over their less successful rivals is the attractive way in which they are packed.

Another most important thing to bear in mind is that of giving value – honest value, not reckless giving away at the start to catch a customer. The genuine buyer is suspicious of receiving what he knows to be over value, and the ones who are willing to buy such are those who will always have their eyes open for similar bargains. Start by giving good honest value, and stick to it. This rule has been the backbone of many of our oldest business houses.

Lastly, do not despise the day of small things. A housewife told me recently that a greengrocer once called with some very nice Peas. After explaining that he was trying to work up a round for his produce, he mentioned the price, which was right, but it so happened that although her family was usually a large one, they were nearly all away on holidays, so she asked him to bring her a quarter of a peck. Instead of doing so, he departed, grumbling that it was not worth bothering with, and thus, short-sightedly, threw away a valuable customer. On the other hand, I know a man who grows such things as Tomatoes, Cucumbers, and pots of bulbs—little useful trifles of that sort. He started in a very small way, taking round only a few pounds of Tomatoes and selling them by halves and quarters. That man is on the way to having a pony and cart and a man to sell for him, and his methods instinctively follow the lines I have laid down.

I have dealt with the subject broadly. Those who appreciate the soundness of the principles will easily be able to apply them to their lasting benefit.

The Co-operative World.

Co-operative Production and Distribution.

Mr. F. R. Hemingway, who presided over the Coimbatore Co-operative Conference, held this month, offered a word of warning about co-operative production and distribution. He said that co-operation for purposes of production and distribution is a very attractive idea, and in many cases the absence or the tyranny of private agencies makes such co-operation highly desirable; but this kind of work, this "amateur trading," has its own dangers. The amateur trader is apt to burn his fingers, for want of that foresight and knowledge which the professional traders have taken years to acquire. Trade Unions are apt to be large, and any serious loss at the commencement of this movement might well be disastrous. He therefore earnestly urged not to be in too great a hurry, and to study with great care every side of such enterprises, so as to make quite sure that there is no reasonable ground to apprehend a failure. The possibilities, of useful co-operative work on such lines are immense, but there are dangers, and one ought to be on the watch for them.

The Moral Effects of Co-operation.

Mr. A. C. Chatterjee writing on the moral results of the co-operative movement in the United Provinces observes that, cases are now numerous in the societies where in a village whole castes as well as individuals have given up drinking, gambling and other vices, that rendered them ineligible for election. In many localities elementary schools are maintained by a grant from the profits of the society or by a special levy amongst the members. Sanitation and medical relief have also been taken up in some cases. Many *punchayets* stock a supply of quinine for the use of members and their families. Petty disputes amongst members of civil or criminal nature are now usually referred to the *punchayet*. Extravagant expenditure at marriages, funerals, or festivities has been much curtailed. Many villagers have told Mr. Chatterjee that formerly they spent more than they could afford on such occasions to avoid odium. Now they can safely say that they are not permitted by the *panch* to indulge in ruinous hospitality.

Co-operation in Small Industries.

Among the advantages of co-operative production over individual production, (*i.e*, every man working in his home) are, according to the *Karnataka* :—

(1) The quantity of the outturn is increased. "Two greyhounds running together kill more hares than four greyhounds running separately." Production on a large scale is a condition of prosperity and the absence of that condition is largely responsible for the present plight of our industries.

(2) The quality is also improved as the result of a scientific division of labour.

(3) The raw material can be purchased in large quantities, and therefore at a cheaper price.

(4) The workman will not be under the necessity of selling away his wares at a low price.

(5) It will facititate the purchase of costly tools and machinery as of the services of teachers and experts.

(6) The assemblage of a number of workmen in a common workshop helps to break the monotony of individual toil, and keep them cheerful. It will lead to healthy emulation in matters of diligence and honest work.

(7) Experiments and demonstrations can be carried on as in a class-room; improved methods can be taught, new implements can be introduced and fresh ideas can be explained under the many advantages peculiar in a school-room.

(8) It will enforce discipline in as much as every member will be under the well-meaning scrutiny of every other member. It will also infuse the spirit of brotherhood, self-respect and responsibility; encourage thrift and foresight and create mutual confidence and credit,—which last is so much lacking at present,—among workmen.

(9) When, either as a working partner in the mere profits or as an equal co-partner, a workman acquires some share in an establishment, he becomes a part-owner; and a consciousness of the fact gives him hope and courage. He will have something to call his own and fall back upon in sickness or other contingency. And in the evening of his life, he will have, as Leclaire dreamt, "the wherewithal to live in peace, without being a burden upon anyone."

(10) Participation in the affairs of an organization gives him a training in the up-to-date methods of business, gives him a wider outlook on life and gradually befits him for a share in the public life of the country.

Industrial Co-operation in the C. P.

It was only in the year 1910, that the Industrial Department of the Central Provines took up the work of encouraging the people to start Co-operative Societies for industrial purposes. As is now the case in Madras, the Registrar of Co-operative Societies held, till then, that the movement under his charge was not sufficiently advanced to undertake the work of co-operative purchase and production The Industrial Department however, started 9 societies, mostly for weavers and metal workers, and all of them have been successful. In addition to these, there are now 9 other Co-operative Industrial Societies for weavers and dyers working independently, of the department. Speaking on weavers societies, a co-operative worker at the C. P. Conference said:—"The first society had to be established by hardwork and perseverance; the second society came forward spontaneously when it saw the success of the first and recently a third society has been organized by members of the first two societies." These societies have done much good to the members. Instances are given where each member has saved at the rate of one anna on each rupee of his purchase, and all these Societies have shown their willingness to follow the suggestions of the Industrial Department as to improved technical methods. The village handloom industries that have sprung up in Austria on account of the co-operative movement, are said to have competed sucessfully with the mill industry of the towns and this movement has also given a great impetus to village handicrafts in many parts of Europe. Is it too much to expect the same beneficial results to follow in India also?

Co-operative Credit in England.

In page 177 of the March issue of the *Wealth of India*, we stated that negotiations had been concluded with the joint banks to help with funds the Co-operative Credit Societies to be started in England. The following details of the arrangements will be read with interest.

As regards the extent to which the banks will be prepared to provide a Society with capital, each bank naturally reserves to itself the right of requiring in each case satisfactory evidence as to the security for the loan; and indeed, no sound banking institution, whether State-aided or not, could be expected to make an advance of money to a Society without making sure that there was a practical certainty that the advance would be paid.

As regards the form of security to be required, the banks have agreed that the joint liability of the members of the Society may be accepted as an adequate security for a proposed loan, without any further guarantee for its repayment; subject, however, to the general condition already mentioned, that the bank is satisfied that the joint liability is in the particular case a sufficient security. It is to be expected that when a Society wishes to take advantage of this arrangement and obtain a loan from a bank without any special guarantee, the local bank Manager and the Directors will, require to be satisfied that the Society consists

mainly of thrifty, industrious men, that the Committee is composed of trustworthy members of good character and credit, that the affairs of the Society are conducted in a business-like manner, that the loans to members are really expended on profitable agricultural purposes, and that these loans are punctually repaid on the due dates. Indeed, in the interests of the co operative credit movement, and of the individual members of the Societies, it is not desirable that any institution should make advances to a Society which cannot fulfil such conditions.

As already said, the arrangement made with the banks relates only to Co-operative Credit Societies, so that if the members of any other form of Agricultural Co-operative Society wish to take advantage of it, it will be necessary for them to combine their credit by forming an entirely separate Credit Society, confining itself solely to the business of making loans to its members for profitable agricultural purposes. It does not reduce their existing facilities for borrowing money, whether from Joint Stock Banks or from other sources. All that it means is that these banks have now expressed their willingness to give valuable assistance to Agricultural Co-operative Credit Societies on favourable terms in cases where approved security can be given.

Co-operation in Japan.

The monthly *Bulletin of Economic and Social Intelligence* published by the International Institute of Agriculture gives the following interesting particulars of co-operation in Japan:—

The total number of co-operative societies in Japan on June 30th, 1909, was 5,149: on June 30th, 1912, it had risen to 9,394, of which 2,676 conducted credit business exclusively. The number of Federations has also considerably increased: on June 30th, 1911, there were 22 and on June 30th, 1912, 30. The department considers that the average number of members per society is 105, and therefore calculates the total number of the members of the 9,394 co-operative societies on June 30th, 1912, at about 980,000, more than twice the estimate made in 1909 (445,000). It is also well to observe that 81·93 per cent. of these members are farmers: at a great distance come the commercial class (6·41 per cent.), those engaged in industry (4·04 per cent.) and those engaged in fisheries (1·71 per cent.).

With the increase of their members and the prosperity of the co-operative societies, the capital also increases. In 1910, in 4923 societies examined, the amount of members, contributions was 19,291,155 frs. which is an average of 3,919 frs. per society and 37·67 per member. In the same number of associations, in the same period, the amount of loans passed was 8,407,650 frs. Including the amount brought forward from the preceding year, the total amount of the loans at the end of 1910 was 29,350,200 frs., with an average of 5,960 frs. per society and 55 frs. per member. In the three years' period 1907-1908—1909-10 only savings showed a tendency to decrease, not in their total amount but in the proportion per member.

In fact, while the number of depositors in the co-operative credit societies (which act also as savings banks for their own members) increased from 44,314 at the end of 1907 to 233,485 at the end of 1910, the amount of the deposits had increased from 1,544,129 yen (4,014,730 frs.) to 7,204,824 yen (18,732,200 frs.), and the proportion per member fell from 34·84 yen (90·50 frs.) to 30·99 yen (10·50 frs.). This is attributed to the fact that the new depositors are for the most part very poor farmers, whose contributions, if they serve to increase the total amount of the savings yet tend to lower the average of the deposits. It is sufficient for our purpose to observe that cases are not rare of deposits of not more than 10 sen (0·25 frs.).

In conclusion, it is observed that the Japanese co-operative movement, started little more than ten years ago and reinforced hardly three years ago by the law of 1909, shows a rapid and constant progress such as perhaps is not to be met with in any other country.

Co-operative Egg Production.

The Ryot in India cannot improve his lot solely by depending on agriculture. He must earn more by engaging himself in subsidiary industries connected with agriculture. Egg-producing is a profitable industry provided the methods of sale are well organised. The example of Denmark in this respect is worth closely studying. The following particulars of the system in vogue there are culled from a paper read by Professor P. V. Muller at the last Poona Co-operative Conference. Mr. Muller would apply similar methods in Bombay but they are apparently suitable to all important towns in India.

During the last 20 years, eggs have become an important article of export from Denmark. This business has been entirely built up by the Egg Export Co-operative Society. In 1909 it numbered 52,000 members belonging to 550 local Societies. Stamps and often special collecting boxes or cases are supplied by the societies. Every egg is stamped with the society and the member's number, so that if necessary it can be traced back to the fowl that laid it. If by chance an individual member of one of these societies should supply a bad egg, he is hunted down and fined the equivalent of Rs. 4, whether the fault be his or that of the fowl. 10 million scores of eggs pass through the hands of this society in the course of the year. When they arrive in Copenhagen, or at one of the other ten packing stations in the country, they are graded by weight, the cracked are sold locally for cooking. The rest are examined in front of powerful lights. They are then packed in cases with shavings, 960 in a box. Some are put down in strong lime water and can thus be kept for months. The bulk of both fresh and "pickled" eggs go to England. In India of course the eggs would be sent to the large centres of population. The Danish Society began in 1895 and grows larger and larger. It started with little or no capital, indeed farmers had to wait 4 weeks to be paid for their eggs. Now it has a reserve fund of £15,000 which is used as working capital. The central society settles the price of the eggs which is fixed at a figure sufficient to clear a profit. In 1909 the profit amounted to £10,000 of which half was distributed to members and half went to the reserve fund. Every six years the reserve fund is distributed, six years' reserve being always kept in hand. Here seems an institution which might be imitated at once in the Bombay Presidency with great advantage. Thus an important addition might be made to the income of the local cultivators by a proper system of egg collecting in each village and their safe despatch to large towns and their sale there, all on co-operative lines giving the full benefit to the producer.

There is, however, a phase of these egg collecting societies which might prove still more useful here and render co-operative distributing stores, not only possible, but a great success. Almost every parish in Denmark has its co operative store—all united under central federations. One of the cardinal principles of such a store is that all payments for goods received must be cash. Now the villagers have not always a ready supply of that necessary article and so the local store acts as a depot for the local egg society and eggs are received and examined by the manager in payment for goods at the rate fixed by the egg society. If more eggs are delivered than goods are required, the balance is paid for in cash. Such a village co-operative store is managed by a board of the members, they have a paid manager, who usually lives in the store and who is himself a member, and an auditor, who is usually the village school master.

Mr. Rajagopala Chariar on Co-operation.

The following extracts from the address of Dewan Bahadur P. Rajagopala Chariar, C.I.E., President of the 5th Chingleput District Co-operators' Conference held at Uttramerur, will be read with interest.

THE GOVERNMENT AND THE MOVEMENT.

There can be very little doubt that the large development of the co-operative movement we have had has been due mainly to the cir-

cumstance that the movement has, from the outset, been carried out by a Government Department; it has had the benefit of the prestige and security afforded thereby; and also, thanks to the very business like methods of the Madras Central Bank, the movement has been freely financed. In addressing the last Provincial Co-operative Conference, the Hon'ble Sir John Atkinson drew attention to the remarkable fact that, whereas the Co-operative Credit Societies have thriven, Joint Stock enterprise has languished The explanation is not far to seek, and I am in a position personally to offer that explanation, because, when I began work in this district, one of the difficulties I was confronted with was the failure of a number of Benefit Societies and Provident Funds which had been registered under the ordinary Companies' law and the break-down had engendered a wide feeling of distrust. I was, however, able to utilise that very break-down for advertising the co-operative movement, for I was in a position to point out that, under the law of 1904, a *Government* machinery had been provided for supervising the societies, for auditing their accounts, and for seeing as far as possible that they did not get derailed. Many of you no doubt remember how telling this argument of mine was. Many of you told me, at the time, that you wanted no direct help of any kind from the Government, you were not at all keen about having any Government money, you wanted no summary procedure for recovering your debts, but you *did* want careful Government supervision and audit, and as *these* things had been provided, you were willing to follow my advice and to start the societies. The Central Bank did the rest. When it was seen that the moment a society was started in a village, the ryots could get practically as much money as they really needed, at a rate of interest markedly lower than had before prevailed, the movement spread rapidly. I say again that the rapid spread of the movement has been undoubtedly due to the Government machinery and the free supply of funds.

UNDUE ELATION TO BE DEPRECATED.

And this brings me to a fundamental distinction between the movement as it developed in the European countries, from which we have borrowed these banks and as it has developed in our own country. *The Popular Banks of Europe were entirely un-official in their origin.* The course of the movement here has been very different. As already stated the Co-operative Societies we have are practically all the creation of a Government Department; their well-being depends to no small extent on the supervision exercised by that Department. I mean no disrespect to the large number of non-official gentlemen who have helped me and my successors in office when I say that, if to-morrow, the Government were to notify that they proposed to withdraw from that active association with the movement which is now its prominent characteristic, the majority of the societies would disappear with a rapidity which would surprise the European expert even more than the remarkable progress of the movement has done. I do not of course mean to say that the Government are likely to do any such thing, or that they will be justified in doing any such thing, but I want to bring home to you that it will be a mistake to over-rate the intensity of the co-operative spirit among us from the mere number of the societies or the rapidity with which they have sprung up. This rapidity has been so phenomenal and has been so startlingly great—compared with the development of these banks in their original home—that one would almost think that we are more truly co-operative than people in Germany or Italy and that it was by the merest accident that *they* devised these banks and *we* had to imitate them. I would earnestly deprecate any feeling or undue elation at the success already achieved. Of course we are all glad at what has been already done. The danger of the situation is that, in the satisfaction we feel at what may be called the quantitative progress already achieved, we may fail to take due note of our mistakes and shortcomings.

MORE NON-OFFICIALS REQUIRED.

I shall now tell you a few reasons for my opinion that, notwithstanding the large increase in the number of the banks, &c., there has not been anything like a corresponding increase in the co-operative spirit. Firstly, the idea which underlay the Government policy, as I have always understood it, was that a sufficient number of banks should be started so as to serve as models to the people and enable them to start more for themselves; and that on a large scale. Over a thousand banks have now come into existence; by far the greater portion of them owe their existence to the activity of the Government Department. Well, the Government cannot go on starting banks themselves in every place; the Government establishment cannot go on increasing indefinitely; there was, I believe, some lull in the Government activity. There was, I am told, a corresponding lull in the registration of fresh societies. At the last Provincial Conference, Sir John Atkinson asked the very pertinent question whether the time had not come when the organisation of new societies could not be better carried out by the unofficial rather than by the State agency. I could give only one answer to this question, *viz.*, that if, after nine years of work and with over 1,000 societies working in the field, unofficial agency is not forthcoming to an adequate extent to organise more societies and if the Government Department cannot be wholly relieved of the task, then the movement must have made very poor progress indeed. The Conference unanimously passed a resolution to the effect that it believed that there was a genuine demand for the establishment of more rural societies in this Presidency and it requested the Government to take the necessary measures to ensure a statisfactory and safe acceleration in the growth of the movement. I of course quite agree that we want more societies; if we had to-day ten times the number that we have, it would still be found that we want a great many more. But what I do not understand is why the *Government* should be asked to take measures for the statisfactory and safe acceleration of the growth of the movement. Is it contended that the one thousand and odd socities we now have are insufficient to serve as object lessons? Or is it that our unfortunate tendency to lean on the Government for every thing has become, in the case of the co-operative movement, accentuated by the way in which the movement has been handled? Gentlemen, I would, as an old friend, earnestly advise you to pause a bit before you press this demand for more societies being started *by the Government*. I would advise you to take the starting of more societies wholly into your own hands. You could then proceed at a rate which no Government Department could achieve. To prevent misunderstanding, I would beg of you to note that I am speaking of the *organisation of new Societies*; I am not speaking of the *supervision* and *audit* of the societies, *after they are started*, which, under the law, now vest in the Government Department. Of course, registration cannot be refused to a society, otherwise eligible for it, solely on the ground that it would impose extra work on the Government Department to supervise and audit it.

NOT MUCH EDUCATIVE RESULT.

Another evil of the present situation, which is incidental to the line of policy adopted, is that the movement has apparently not had the same educative results which it is said to have produced in other countries. This aspect of the movement is one on which Sir F. Nicholson is never tired of reiterating; a perusal of his book would show that the Co-operative Banks in European countries have produced the most remarkable results in developing thrift, prudence, self-control, and a number of other cognate virtues. I do not of course say that no results at all in these directions have been achieved here, but I believe that I am not far wrong in saying that compared to the large development in the number of the banks, etc., the educative development has been inappreciable. I would invite your particular attention to this aspect of the matter. No Government Department can do much in this

direction. It has to be done if done at all, by yourself.

Government Department cannot do much in a matter like this. The leading men in each village must recognise that their society does not exist solely for the purpose of getting for them a loan from the Madras Central Bank, to be distributed among the needy people in the village but it should also be the object to educate the villagers in those ideas of thrift and self-help which are so vital to well being.

DANGER OF CHEAP MONEY.

It is probably because the *educative* part of the movement is not making adequate progress that the other evil of increasing the volume of indebtedness—*pari passu* with the reduction in the rate of interest and the increased facilities for borrowing—is now looming ahead. Here again, we have only to refer to Sir F. Nicholson's book to take our warning. Sir. F. Nicholson is never tired of reiterating that *what is needed is not mere extension of credit but credit which would educate and discipline the borrower*. .

It would be interesting to know how far it has been possible in this district to obviate the dangers of a mere extension of credit without any of its educative safeguards. . .

This, gentleman, is an important matter, and here again, the Government Department can do very little to obviate the evil. The remedy is in your own hands and there should be no hesitation in applying it. I would beg of the leading men in every village to intervene, even at the risk of unpopularity, and to see that the boon of cheaper and easier money, which the movement has brought to the villages, is not abused. I understand that, in some villages in this district, the ryots have not really derived much benefit of a permanent kind from the movement, because, the borrowers have, taking advantage of the cheaper rate of interest and other facilities, borrowed more.

In other words, the result has been that the burden is again the same so far as the volume of interest paid is concerned, and in regard to the principal, it has become greater than before. It is to meet this particular evil that the Raiffeisen Societies insist on what is known as the "productive employment" of the borrowings made from them. Though our village banks are now almost wholly on the Raiffeisen model, yet comparatively few of them, I am told, work effectively this important Raiffeisn principle. In the infancy of the movement, the dangers of cheapening money, have probably not accentuated themselves, yet it is there; the evil is bound to grow; and I would advise every one of you to view the matter seriously and to make a strenuous fight against it.

OTHER FORMS OF CO-OPERATION.

Another indication of the comparative weakness of the co-operative spirit is the almost complete failure of the movement in the branches of co-operative activity other than that relating to pure credit. . . What of the Productive and the Distributive Societies? Of the two Productive Societies we had at one time, one has, I see, disappeared, and in the other, my friend Mr. Ramachandra Sastri is still struggling on with his self-imposed task of reclaiming the Conjeeveram weaver. As for the Distributive Societies, some of them have been dissolved in recent years; we have, I am told, only half a dozen of them in all now, and less than half the number can be considered successful. The one conspicuously successful Distributive Society, that of Triplicane, was organised and was in working order before it applied for registration: it received no help of any kind from the Government Department except the bare audit. It is significant that the one society which owes least to the initiative of the Registrar and his staff is now the strongest in the co-operative fold.

The branches of co-operative activity other than that relating to credit are much more difficult to organise and to work, but that is all the more reason why they should not be neglected. After all, to borrow money is not a very difficult thing—when there are people to lend it. I think, Gentleman, that the time has come when you should devote the greater portion of your time and energy to the task of forming and working the numerous kinds of

societies other than those relating to mere credit.

GOVERNMENT SUPERVISION ESSENTIAL.

I shall now say a few words in regard to the important question of the Government supervision. I feel that the first need of the movement—if it is to become really healthy—is to un-officialise it gradually. I see that the Government have, more than once, said in recent years that the time has come for a substantial devolution of their task of supervision. So recently as last January the Government, pointed out "the obvious objections to keeping the movement always under purely official guidance and supervision." The Government considered that the "true remedy for the abuse indicated by the Registrar" lay "in promoting a spirit of enquiry and vigilance among the individual members of the societies and in the fostering of the growth of an un-official inspecting agency controlled as far as possible by those who finance the societies." In the opinion of the Government, the organisation which should take up the inspection and general control of the societies should be one which would fulfil the "combined object of financing and controlling the member-societies" for the very obvious reason that "the power of the purse would give such a union a means to penalise any society of whose administration it disapproved, while its own financial interest would tend to ensure a very proper care on the part of its inspecting staff." It seems to me, Gentlemen, that every true friend of the co-operative movement should welcome the above pronouncement. It is a step in the direction of that un-officialising of the movement which many of us, who have watched it with some care, consider it absolutely necessary should be taken in hand. At the same time, there is, of course, the fact that the new agency for supervision would take a long time to develope, and the societies would naturally feel that they should not, during the period of transition, be allowed to run any risk for want of adequate supervision. You need not, however, have any anxiety on this score. His Excellency the Governor publicy gave all Co-operative Societies, last December, an assurance on this subject. I shall quote His Excellency's words: "It may be, and I trust it will be, that in time to come this movement may grow so strong as to wish to stand alone and be independent of all Government support. But that time has not yet come, though it is gratifying to see how very small a portion of the capital involved is provided by Government. At present the work of inspection and audit lies with Government. I need not point out to you that upon the efficiency of inspection and audit public confidence in your movement largely rests. It is therefore my view that, so far and so long as this is so, the work undertaken by Government should be thoroughly done by a competent and adequate staff."

Gentlemen, after the emphatic pronouncement quoted above, by the head of the Government, you need have no apprehension on this subject. There is no chance of any policy of withdrawal or diminution of control being worked to your detriment. At the same time, I think that it will be to your own interest to prepare yourself gradually for the coming of the time when the movement would be able to stand on its own legs and to get on with a comparatively small volume of Government control. In his very interesting paper on 'Supervision,' my successor in the office of Registrar, Mr. Ramachandra Row, has pointed out that, even when the societies were so few as 63—which was the number when I handed over charge to him—I had told him that the system of detailed supervision by the Registrar would not do. Mr. Ramachandra Row's experience appears to have been entirely in favour of the view that "continued supervision by Government Inspectors was impossible and inadvisable."

He was against co-operation "becoming departmentalised." In Mr. Ramachandra Row's opinion, while "the Government is morally bound to continue the system of supervision by Government Inspectors till all societies have been affiliated to Unions, as Unions are formed, the strength of the Government establishment may be reduced so far as supervision is concerned." I am glad that the need for transferring gradually the supervision over the societies from the Government Department to Unions and Federal Banks was recognised at the last Provincial Conference. It now remains for you, Gentlemen, to give effect to this policy so far as your district is concerned. Of course, after any amount of devolution, a certain volume of Government supervision and control would, I take it, always remain. But that will be in the nature of an intelligent *direction* of the movement. It will presumably be done by a highly paid staff. Your claim for that kind of direction will be considerably strengthened if you take active steps—by forming Unions, etc.,—towards reducing the large volume of that petty and detailed supervision by the Government Department.

The Industrial World.

Preparation of Hemp.

THE Committee of "The London Hemp Association" have communicated a memorandum to the Agricultural Departments of the different provinces in India. They point out that by improving the methods of the preparation of Hemp (Crotellaria Juncea or Sunn) a considerably larger field of consumption would be created and better prices would be paid by consumers. Certain provinces in India, *e.g.*, the Godavari district, turn out the article as well as it is reasonably possible to do, but in other districts, especially Indore, Chandausi, Godhra and Pilaphet, it is the practice to ret the hemp in mud or in muddy water with the result that the colour of the fibre becomes dark and a considerable amount of dust adheres to it, which comes out in clouds in the spinning of the hemp. This is not only detrimental to the health of the workers but seriously reduces the value of the fibre through the heavy percentage of waste which generally amounts to over thirty per cent. The principal desiderata in hemp are, firstly, it should have strength, secondly, it should be thoroughly free from stick, dirt and dust, and, thirdly, it should be as light in colour as possible.

It is possible to improve almost all the hemps of India in one or other of these respects.

Another fault the committee call attention to is the practice of twisting the heads of hemp into plaits instead of packing it straight or with one fold.

The exports of hemp from the Madras Presidency are not very large, yet in 1911-12 they exceeded 2,200 tons. As with all other articles, the best prices can only be obtained by preparing the article in a manner suited to the market. It is time that those engaged in this industry realise the folly of the methods complained of lest a profitable trade should be lost.

Marking Sheep.

The French Syndicate of Wool Merchants and Manufacturers has recently given some attention to the question of marking sheep, which skin merchants will do well to note and act on. Many farmers and breeders cause considerable damage to the wool by using pitch or coal-tar. It is well nigh impossible to remove such matters, for on degreasing the fleeces, they melt and spread in the wool, making it sticky and black. In some instances traces of this system of marking can be found in finished woollen goods. The Syndicate has called the attention of farmers and wool growers to the losses they sustain by this mode of marking, by which each skin is depreciated 5*d.* at least. Quite a large proportion of the sheep received at the Paris market (La Villette) have been marked with coal-tar. The use of coal-tar colours ("anilines") has also been fairly frequent, nearly all the Algerian sheep being thus marked, but wool scourers object to these colours, which, to a great extent, are indelible. The Syndicate has announced that the practice of marking sheep by the systems just described ought to be discontinued for the benefit of all concerned, and has stated that the following methods would be found far more satisfactory :—(1) tattooing the ear ; (2) fixing a metal disc to the ear ; (3) using a colour consisting of linseed oil, essence of turpentine and prussian blue, or any similar colouring matter. This mixture should be painted on the nose, or the forehead, or on the nape of the neck.

Condensing Milk.

We read in our Bombay contemporary, *Science and Industry*, that the process of condensing milk is not difficult, nor is the apparatus required complicated. The following are the general lines upon which a condensed milk plant is worked. The new milk is taken to a scalding pan, whence after being raised to the required temperature and sweetened, it is

drawn by a pump into a vacuum pan. There the quantity is reduced by boiling, at a temperature not exceeding 120^0, to about one-fourth its original bulk. It is then drawn off into tin churns and placed in a cooling tank, which is furnished with agitators or stirrers. When sufficiently cooled, it is ready for filling into the small tins in which it is retailed. Such plants can be had in various sizes to deal with quantities up to 600 gallons of milk per hour.

A source of trouble in milk condensing is the necessity of reducing the changes resulting from the action of heat. There is also the danger of separating the fat and the formation of sugar of milk crystals. These can be avoided by never subjecting the milk to high temperature and by homoginizing. To reduce the acidity, bicarbonate of soda is sometimes added, which also checks the separation of the fat. Milk crystals may be avoided by careful attention to the concentration. Condensed milk is generally sweetened by cane-sugar, which assists the concentration, whereas unsweetened milk contains much more water. Condensed milk made from skimmed milk is a poor nutriment owing chiefly to the deficiency of fat, the percentage being 0·29 as compared with 9·62.

Preserving Fruits for Exhibits.

The following suggestions are made in The *Monthly Bulletin* of State Commission of Horticulture, for December 1912 as the result of incomplete experiments and with the consciousness that this is only in the nature of a preliminary report. Barring details. it will be found nevertheless to furnish a basis for further experiments. Considerable success has been attained along these lines in preserving specimens of fruits, leaves and twigs for the purpose of showing insect pests *in situ*, with a natural condition of the plant, and it seems certain that the plan can be perfected.

The following is a brief outline for tentative working basis for conducting more experiments as to length of time for treating and for proportions, all of which must vary according to the structure of the tissues of the plant specimen, or the fruit and the amount of juice or sap present.

(1) Immerse specimen in solution of copper sulphate, 1 part to 500 to 1,000 pure water, about three or four days.

(2) Siphon off fluid, wash carefully by adding water through tube reaching to bottom of the receptacle ; siphon off the water and add in same manner more copper sulphate solution, double strength used first; let stand five to ten days. If plant tissues are soft or pulpy, or rich in sugar, etc., add to this solution one-half to one per cent. glycerine.

(3) Remove fluid in same manner and let stand in pure water twenty-four hours .

(4) Remove water and add solution of 40 per cent. formalin, 1 to 500, plus 1 or 2 per cent. glycerine and 3 to 10 per cent. alcohol, and let stand one to three weeks.

(5) Wash carefully as before.

(6) Add final preserving fluid. For most specimens, solution of sulphurous acid, 1 to 500 is best, to which may be added if necessary glycerine and alcohol as with the formalin solution.

Instead of sulphurous acid, it may be best for certain specimens to use solution of formalin for final preservative, or in some cases boracic acid, or even salicylic acid, while in a few cases more or less alcohol alone or in combination is required.

This final solution needs to be changed from time to time, whenever the growth of fungus forms a complete, firm, mouldy scum on the surface of the fluid.

A small air space is necessary in any sealed or glass-stoppered bottle to allow for expansion of fluid at different temperatures. The more succulent the specimen the weaker should be the solutions of copper sulphate.

Cotton Weaving.

Mr. Richard Marsden in his book on "Cotton Weaving" makes the following remarks:—

"There is one lesson that should and will be drawn if the history of the cotton trade be read widely ; it is that the trade does not belong to the merchants, capitalists, and work-people of the present generation, but that it is a

great national property in which they possess only a life interest. This, they are bound by every sentiment of affection for their children and love for their country to pass on to succeeding generations not only unimpaired but increased in value. To *neglect* this duty will be to deprive millions of English people in the future of the means of livelihood and the nation of one of its most important resources. This would be politically criminal and would do much to depose the country from its eminence in the community of nations."

If the conditions as they existed before 1895 in England were such as to justify the above remarks, what, asks Mr. Venkoba Rao in a local comtemporary, shall we say of the present state of things in India? English History has shown that comparatively England then enjoyed its bright period of prosperity; its trade in textile fabrics found its eminence in the commerce of the world, and yet Mr. Marsden felt dissatisfied. The reverse has been the case in India. The cotton fabrics which once excited the admiration of the world are now gradually losing their place; the Indian clothes which used to be extensively worn by the upper and wealthier classes of England, so much so that legislation had to be invoked to check the growing tendency of the people for buying in light fabrics from India, is not even patronised by the well-to-do in the very land of production. The weavers have been left most cruelly, and be it said to the shame of the educated section in India, to shift for themselves. The educated community which fill the ranks of lawyers and officials have not a word to say by way of protest. In Mr. Rao's opinion, they are the worst sinners, for on them the duty of reviving the trade and the manufacture of cloths heavily devolved by the altered state of political circumstances, and they have, to adopt Mr. Marsden's phraseology, culpably and criminally neglected this duty. The textile industry occupies the position next to agriculture in this country, and it would be idiotic to allow it to become an easy prey to the competition of Manchester.

Japanese Industries.

In discussing the annual trade returns for Japan and their connection with the industries, Mr. Oka, Director of the Industrial Bureau of the Japanese Department of Agriculture and Commerce, said :—Raw materials have long figured largely in exports and are still showing an increase, but the ratio of the increase has of late been very low when compared with exports of manufactured goods. The export of partly manufactured and fully manufactured goods is making steady progress both in amount and percentage the former at present accounting for 50 per cent. of the whole of the exports, while the latter has advanced at the rate of 25 per cent. in the year 1893-1894 and over 30 per cent. in 1902 to 1907. This phenomenon proves the steady development effected in Japanese industries, and the fact that a great deal of raw material is being digested in the country. The import of raw materials has made remarkable progress and the amount which was less than 1,100,000 *yen* in the year 1877, had increased to over 200,000,000 *yen* in 1910. This is the result of progress in Japanese industries, the increase in import of raw materials keeping pace with the export of manufactured goods. Imports of partly manufactured goods showed a rapid increase in the years between 1904 and 1907, the amount exceeding 100,000,000 *yen* in 1907. But this increase is not significant, on the whole, as that in raw materials, the percentage annually ranging between 10 and 30. Concerning the import of manufactured goods, the amount reached 150,000,000 *yen* in 1907, owing to expansion in various enterprizes as a result of the Russo-Japanese war. It had decreased to 120,000,000 *yen* in 1909 and 1910, but again increased to 150,000,000 *yen* in 1911, in anticipation of the revised tariff. The percentage is, however showing a gradual decrease, standing at over 40 in 1892, 36 in 1911. From the above facts, it will be seen that Japan has changed its position since the year 1892, and is now a country importing raw material on a very large scale.

Industries In Bombay.

An interesting summary of the progress of manufactures and industries in the Bombay Presidency during the past ten years is published in the Administration Report for 1911-12, just issued. We notice that during the period under review the number of factories has more than doubled, and by far the greater number of the seven hundred and ninty-eight factories at work in the Presidency are engaged in textile manufactures. There are 312 ginning and pressing factories, situated chiefly in Khandesh, Surat, Ahmedabad, and Hyderabad districts and in Kathiawar, and 148 spinning and weaving mills. The latter produce yarn, mostly of the lower counts, and cloth spun from indigenous cotton. There are 33 spinning mills in Bombay City and 46 spinning and weaving mills as against 12 and 29 respectively in Ahmedabad. In all, 497 factories are concerned in textile industries, of which only 26 belong to European Companies. The total number of persons employed in textile factories is 154,151 males and 44, 018 females. Fifty-seven factories are surpervised by Europeans and 444 by Indians, of which the great majority are Vanias or Parsis.

During recent years there have been great variations in prosperity, due partly to natural fluctuations in the markets and party to the dangers of speculative company promoting. On the whole, however, progress has been steady. Next to the cotton industry in importance comes the food industry with its 66 flour, rice and sugar mills, and the art of printing with its 61 presses. There are also 43 iron, steel and engineering works and 20 tanneries. The total number of persons now employed in connection with power industries is 220,527 males and 49,809 females. The industrial expansion of the Presidency is going on as rapidly as can be regarded as healthy and is profoundly affecting the lives and habits of the people. There is little doubt that the comparative immunity of even the lower classes of workers from the Gujarat famine of 1911 has been due to the fact that the mills of Ahmedabad, Nadiad and Broach gave employment to agriculturists whose crops had failed. It has become habitual for large classes of the smaller cultivators to till their fields during the monsoon and after reaping their crops to migrate to the towns for labour during the off-season.

Bell-Metal Industry.

In the *Modern Review* for May, Mr. Radha Kamal Mukerji gives an account of the manuacture and sale of bell metal or kansari vessels. It is a village industry thriving in important centres of Bengal and not suffering by competition with articles made by machines. Bell-metal is an inferior alloy of tin, zinc and copper, costing Rs. 30 to Rs. 40 per maund. Artizans find it more profitable to use old worn out vessels than to manufacture fresh alloy for two reasons: (1) The latter is more risky and costly, (2) The former take better polish. The bell-metal is either cast in moulds or hammered. To make the vessels cheap, boys of all castes are employed on Rs. 2 to 8 per mensem. Middlemen enter into contracts with artisans, buy their vessels and sell at their own risk. They pay the chief artizan responsible for making them wages ranging from Re. 1-1 0 to Rs. 6-10-0 according to the nature of the vessel, thal, cup, tumbler, dish, dubia or cup with sarposh.

The praiseworthy feature of these middlemen is that though they engage 50 different artisans they never set one against another. Another point is that the payments have been at the same rate for the past 20 years, only they have risen one anna per rupee. When the middlemen sell wholesale, they take only from 1 to 2 as. per seer, when they sell in retail their rates are 2 to 4 as per seer sold.

But, certain improvements must be made before the industry is more widely spread and the buying public are not put to the necessity of paying disproportionately large prices charged by the middlemen.

The following improvements in the mechanical methods of the industry are suggested. (1) Stamping from dies instead of hammering. The necessary machinery and hydraulic press, however, can be set up only in small factories

for individual workmen cannot afford to buy the machinery costing not less than Rs. 300.

(2) The introduction of improved hand-lathes for chiselling and polishing. In the latter now used, one coolie, pulling a double-ended rope gives a reciprocating movement to the axle and thus there is waste at every reverse pull. The hand-lathe of the Madras pattern, by which one coolie can turn two lathes simultaneously, by producing a continuous rotatory motion with the help of the crank-handle and a rope passing round the shaft of the lathe, is most useful and easily adaptable under the present conditions of the industry. The adoption of such a lathe will be quite inexpensive and at the same time it will save much time and labour.

(3) The introduction of punching machines to save the trouble of cutting with scissors.

(4) The introduction of better and more permanent plate-moulds. A copper pattern may be used as a mould, made in two vertical halves, the pieces being kept together by four small friction clutches.

But more than any improvements in the mechanical processes, the industry needs advertisement. There is a large demand in bell-metal wares throughout Bengal. The middlemen cannot cope with the demand and they charge prices which are often quite disproportionate to the wages they give to the artisans. The employment of agencies which will push on the sale of the wares will greatly stimulate the industry. Again, most of the wares manufactured by the artisans have become stereotyped, the handicraft being degraded to mere automatic work. The diffusion of technical and art-education and the adoption of improved artistic patterns and designs will give a new life to the industry, in which art seems to be now almost extinct.

Date Sugar Industry.

It has been thought desirable in the present state of the Indian sugar industry to investigate all sources of sugar production in this country and Mr. H. E. Annet, Officiating Agricultural Chemists, Punjab, has begun with the wild date palm which is an important sugar producer in Bengal. The results of this investigation have been published in the latest volume of the "Memoirs of the Department of Agriculture in India," issued by the Agricultural Research Institute, Pusa. Mr. Annet hopes later on to carry out similar work with other sugar producing palms in Madras. After reviewing the history of the date palm industry from the times of the East India Company's trade monopoly in 1813 up to the present, Mr. Annet gives a lot of very valuable information regarding the culture of the date palm, methods of tapping, extraction of juice, etc. Mr. Annet at the end has several suggestions to offer towards the improvement of the industry. To begin with, he prefers the date palm to the sugarcane, for purposes of sugar manufacture as there is a much higher yield in the former and there is less risk too in the growth than in the latter. He further states that with the date palm, the yield of sugar is certain from year to year and very little expense is to be incurred in the cultivation. He then makes out a case for the opening of large central factories calling attention to the long season which is possible with palm sugars. He points out that the date palm yields its juice in the cold weather from November to March and the palmyra palm in the hot weather from April to September. He then goes into the improvements suggested with regard to the date sugar industry. He says that gardens should be well cultivated and kept ploughed up in the hot weather. The present native method of refining by means of water weed, he declares, is an exceedingly slow process and recommends the introduction of centrifugals. People should be induced to strain their juice through cloth before boiling it down and should be persuaded, he suggests, to clean out daily the earthen boiling pans which are at present in use. With regard to tapping, he has a very important advice to offer. He thinks that, if the trees are tapped by drilling holes into them by means of auger, a much higher quality of juice would be obtained. He then strongly recommends the use of for-

malin, a good and cheap disinfectant, in order to preserve the quality of the juice. The cut surface of the tree should be lightly washed in the afternoon with a piece of cotton wool dipped in 10 per cent. formalin solution, the result of which, would be, he says, that a very clear juice would be obtained and a juice practically free from yeast. It appears, it would be worth while putting formalin in the pots overnight, because, much of the inversion of the sucrose takes place after the juice has left the tree and while it is standing in the pot overnight. And for the collection of juice he would advise the substitution of cheap metal pails to earthen pots. Finally, he has the following suggestion to make. "Careful enquiries seem to make it clear that the tappers would sell their juice at 4 to $4\frac{1}{2}$ annas per maund, rather than take the trouble to boil it into gur. It seems possible that an enterprising man might find it worth his while to set up in any given centre and buy juice from the surrounding tappers. He might fit up, say, a Hadi process plant capable of dealing with 60 to 100 maunds of juice per day and prepare gur. This gur should be of much better quality than the ordinary gur of the district and should fetch a much higher price." Here is an opening for an enterprising business man.

Wool Industry in the British Dominions.

In the course of a lengthy paper on the "Wool Industry in the British Dominions" read before the Royal Society of Arts, Mr. C. E. W. Bean, M.A., B.C.L., referred to the frequent complaints made by wool manufacturers of vegetable matter getting into the wool. If a shred of twine or jute becomes mixed with the wool, it will often bleach white when scoured and get through any combing process and into the yarn, and finally into the cloth itself; and when a serge or self-coloured cloth comes to be dyed, these vegetable fibres refuse to take the same dye as the wool fibres, and small discoloured flecks or steaks appear in the piece. There will be numerous specks noticeable in each length of blue serge, as well as an occasional piece of burr or grass seed, and maufacturers have to keep special girls regularly at work overlooking the cloth to pick each burr or jute fibre out.

Towards the conclusion of his paper Mr. Bean predicts as follows as regards the future of the wool industry :—The future seems to be that, whilst more and more of the Empire's wool will be that of cross breeds from the farms oversea, still from Australia and South Africa there will always come a large supply of fine merino wool produced on large holdings. The demand for wool is increasing in Europe, and is expected to increase shortly in America. It is growing fast in Japan, and the demand from China, if it comes into existence, is a factor which can hardly be realised. The killing of sheep for freezing tends more and more to keep the numbers down, and except within the British Empire, the world's flocks seem to be actually decreasing. Even in Australasia the increase last year was under one million. The demand for wool seems to grow faster than the visible sources of supply —and, as for merino wool, although fashions such as that for hobble skirts may hit it hard, yet there is and will be only one fashion for underclothing—and that is the fashion for the only sort of wool which is as fine and soft as spun silk. So good is the future of wool that there has, indeed, been anxiety expressed lest it should become too scarce and expensive for use. It has been noticed that the immediate effect of a big rise in the price of wool is that cotton and other substitutes and mixtures come into fashion. Fortunately the most probable substitute for wool in these days is "shoddy" —which is wool ground out of rags and living a second life as it were. Many pastoralists speak of shoddy as if they had a grievance against it. But, in days of expensive wool, nothing is more certain than that some substitute will be used, and, of all substitutes, the one which is best for the sheep-raiser is that one, every ounce of which has, after all, come from the back of a sheep.

In this connection, we may note that there are only five woollen mills in India. The out put of these mills appears to be growing, but,

of course, they supply only a small fraction of the total consumption of woollen goods in India. In 1911 the value of the imports, consisting mainly of piece goods and shawls from Great Britain and Germany, was Rs. 3,45,43,401 whereas the Indian mills' output was valued at Rs. 51,03,640. The two largest mills are at Cawnpore, in the United Provinces, and at Dariwal, in the Punjab, and together account for about 79 per cent. of the total output. They have a paid-up capital of about £213,000, and are chiefly engaged in the protected business of weaving cloth for the army and police. The Indian exports of woollen goods, which amounted in 1911 to Rs. 24,47,655, consist almost entirely of rugs and carpets for which the largest markets are the United States and United Kingdom, this country taking about three-fourths of the total exports.

Laundry Industry

There is no artizan who has impressed his importance to society more than the washerman in India. Putting aside the loss of clothes, and the promise to bring them with the next wash, the delay in returning the clothes has become intolerable and not many even in affluent circumstances can afford to keep a sufficient number of clothes in stock to await the leisurely arrival of the dhobiwallah with his washed clothes. The time has come when the enterprising man may seize the opportunity and make a decent fortune on a fair outlay. We are not aware of many public laundries in India. In Madras, one is run by Messrs. Spencer, but the charges are such that only persons drawing high salaries can afford to deal with them. A suggestion to erect a steam laundry in Calcutta arose sometime ago out of certain observations in the Corporation Review of the Annual Report for 1908-09. In that review, attention was drawn to the way in which the clothes were spoiled by violent beating on the stones and a suggestion was made that the Health Officer might consider whether facilities could not be provided for better work. The Health Officer suggested the installation of a steam washing plant to wash and clean the clothes, the dhobies being charged a fee for each bundle. The idea was approved by the Corporation in April 1910.

Shortly after, Dr. Pearse went on leave, and when in London he inspected an up-to-date laundry and obtained some particulars as to machinery. He estimated that the plant would cost Rs. 7,159, and that the staff required would be an engineer on Rs. 40-50 and an assistant on Rs. 20. The menial staff would be three men on Rs. 10 each. The Chief Engineer estimated that 1⅛ maunds of coal would be required per hour and that the cost of the upkeep of the machinery would amount to Rs. 750 a year.

We believe that some further additions to the estimate have been sanctioned by the Corporation recently. It is a good move what the Calcutta Corporation has made. Dust and dirt are bound to increase with the growth of population so that the laundry business may always be sure of growing patronage in all times. It is essential however that the human element in the business should be eliminated as much as possible and machinery must be installed to do promptly, punctually and profitably. The following extract from the *Times* describing the machinery and processes employed in the laundry business will doubtless be read with interest. Writes that journal :—

The number of power laundries of fair size in Great Britain and Ireland exceeds 3,000. In addition there are a great many well-equipped steam laundries attached to factories manufacturing various classes of goods where the use of washing, drying, and calendering plant is a feature. The motive power is usually obtained from a steam engine with a bolier of sufficient power to provide steam not only for the engine, but for all the machines and appliances. Within recent years, however, electricity has been adopted in a great many laundries. In favour of a steam engine it may be urged that it enables considerable economies to be effected, as by utilizing the exhaustive steam, which would otherwise go to waste, for heating water or a drying chamber. But the electric drive possesses many advantages, chief among them being that the machines can be driven independently by direct-coupled motors, without the need of running the whole length

of shafting to accommodate one or two of them. In this way there is less waste of power.

The wash-house equipment includes a rotary washing machine, a hydro-extractor or centrifugal, a soap and soda-boiling tank, a starcher, hand-wash tubs, rinsing and steeping tanks, and power wringers.

The washing machine is one of the most important parts of the whole plant, for the reason that if the goods are not properly washed, the succeeding processes cannot be carried out with satisfactory results, no matter how carefully the work is done. A washing machine is usually made entirely of metal, and consists of a revolving inner cylinder of brass, in which are placed the goods that have to be washed, and a fixed outer casing of galvanized steel plate. The inner or washing compartment is perforated with circular holes and fitted with brass rubbers or beaters which form the principal washing element. A door with suitable locks is provided on the shell to prevent the goods from falling out during the washing process. The shell is driven by gearing at one end, a reversing motion being provided so that the cylinder makes $2\frac{1}{2}$ revolutions in one direction and a similar number of revolutions in the opposite direction. Hot and cold water and steam are led into the washing compartment with soap and soda solution, and the goods are allowed to splash about during the revolutions of the shell. As the shell revolves, the washing solution is lifted by the hollow brass rubbers and dashed upon the load of goods, so that a continual showering process is set up.

THE HYDRO-EXTRACTOR.

When the goods have been well washed and rinsed, they are taken out of the washing machine through the doors and conveyed to the hydro-extractor. This machine consists of a perforated steel basket revolving at a high speed on a steel spindle, with a fixed outer casing of steel boiler plate. Its function is to expel all the loose water from the clothes by centrifugal force, and eject it through the perforations in the steel basket, this water being drained away. The machine will extract the water from a load of goods in from 10 to 15 minutes, and they are then ready for the next department—*viz.*, the drying chamber. There are several forms of drying chamber, but perhaps the most popular is a range of pull-out drying horses. These horses consist of cast-iron frames with front and back plates, fitted with steel rails, on which the goods are hung. Each horse runs on rails set in the concrete floor, and can be readily pulled out for loading purposes. When the goods have been hung upon the rails, the horse is pushed back into the chamber, which is heated to a temperature of 150° Fah., either by steam radiating coils placed in a pit underneath or by a hot air apparatus fixed on the roof overhead. The system of double compartment or twin drying chambers is also very popular, the fittings in this case being steel hanging rails fixed at the top of each chamber, and the hot-air system being adopted as in the drying horses. A cooling installation is provided, so that while a load of goods is being dried in in one of the chambers, the other is being cooled to permit of the operator entering and unloading in a more comfortable atmosphere; the same process being repeated in turn with the second compartment.

The next and final process is the ironing and finishing, for which a large variety of machines can be used. The most popular machine in laundries of average size is the single roller or Decoudun type. This machine consists of a large steam-heated patted roller, which revolves in a steam-heated bed of semi-circular form, the goods passing between the bed and the roller. The single roller machine is usually employed on starched goods, where a high finish is required, such as table clothes, table napkins, etc. In another popular form of calendering machine there are multiple rollers, varying in number from two up to eight. The principle of this machine is the same as that of the Decoudun type; the goods are again passed between the rollers and steam heated beds, but in the multiple machines, especially those of the larger size, they are dried, ironed, and finished in the machine instead of being first hung up in the drying chamber. In this way a considerable saving in labour is effected; hence the popularity of the multiple roller calendering machine in the larger laundries that undertake a large percentage of flat work.

The collar and cuff-ironing machine is a most interesting mechanical contrivance. The collars are laid on a flat board that passes backwards and forwards under a polished gas-heated roller, by which the necessary finish is imparted. A skilful operator can finish about 300 collars an hour. Other machines employed in the calendering department include power goffering machines for frills and fancy work, neckbanders for ironing the neckbands of shirts, shaping machines for rounding off collars, and hand gas or electric irons.

The Commercial World

Futility of War.

MR. NORMAN ANGELL, the author of the "Great Illusion," recently delivered a speech on the economic futility of war. Mr. Angell's contention is that war is not a "commercial proposition" and cannot be made one. He maintained that it was as much a work of national defence to spread that knowledge as adequately as to maintain the Navy and Army. If Germany, as the result of a naval victory, reduced England to bankruptcy, she would herself be bankrupt ; if half the population of England starved, masses of hers would starve also. If Germany wanted to profit by her victory, she would have to follow England to carry on her business as before—and she need not conquer England in order to do that. Trade depended on having things to sell and knowing how to sell them, not in having more force than some one else. Though England destroyed every ship Germany possessed sixty five million people would go on working and competing with England in the markets of the world. It was in the false principles laid down by British statesmen that German aggressive policy found its justification. So long as English public opinion condoned those ideas, they could not reasonably look for sounder opinion on the Continent ; and as long as those ideas represented the foundation of political thought in Europe, it was impossible to arrive at a better policy. Mr. Angell endeavoured to drive home the view that the State systems of war and preparations for war are, commercially considered, barriers of international commerce. They may—and do—obstruct commerce, but they leave absolutely untouched the causes that make the greatness or even the wealth of a modern nation.

The Dawn of the Oil Age.

A writer in a recent nnmber of the *World's Work* gives us interesting particulars of the history and growth of the world's oil trade. Twenty years ago there were only two countries in the running as oil producers. These were the United States and Southern Russia. Both countries ran hard for the distinction of being the most favoured in regard to reserves, but Russia is pressing hard. It is stated that there is more oil in the Caucasus district alone than in the whole of the United States, and doubtless when other corners of the Russian Empire are investigated further huge supplies, now lying dormant and unknown, will be revealed.

Since the United States and Southern Russia established their firm footing, several other countries have come into competition for the world's markets. Borneo, Burmah, Roumania, Galicia and Mexico are among the most spirited of these rivals. The older concerns did not care for this development, as a fall in price due to supply exceeding demand was feared. So they embarked upon a policy of absorption and destruction. The newer concerns not having secured a footing either were wiped out by illicit trading or undercutting, while others were absorbed, arranged terms or stood aloof to precipitate rate wars. Thus Borneo maintained its independence, but Burmah fell, and was acquired by the Standard Oil Company. Mexico put up a stern fight, and for the time being is victorious. Roumania routed the American Trust in no unmeasured manner, while Galicia succeeded in maintaining its position. While to-day the Standard Oil Company ranks as the largest oil organisation in the world, its power abroad is waning rapidly. Foreign countries are discriminating against its produce by levying taxes on its imports, thereby stimulating native and other developments. There is the danger that these enterprises will fall into the hands of one of the Trusts, but even this possibility is being check-mated effectively by legislative action.

In fact, taking all in all, the British Empire

either is woefully deficient in oil resources, or else the various colonies offer no attractions to the speculator and investor. In 1911 Great Britain imported over 343,000,000 gallons of oil in various forms, to which total the United States contributed some 225,000,000 gallons; while Russia, Roumania and the Dutch Indies helped us out with a further 100,000,000 gallons leaving a bagatelle of 18,000,000 to be drawn from the rest of the world. The total quantity of oil extracted from the earth during 1911 was over 12,500,000,000 gallons, the United States being an easy first with some 8,000,000,000 gallons, while the British Empire is grouped in the "&c." among Japan, Egypt and Peru with less than 700,000,000 gallons. Such a result, says the writer, does not speak very potently for the eleven and a half million squares miles comprising the British Empire so far as concerns the supply of what men call the fuel of the future.

Trade in Aluminium.

The imports of aluminium into India during the twelve months 1st April, 1912, to 31st March, 1913, amounted to 35,809 cwts., valued at Rs. 25,51,455. Commenting on the figures, Mr. Alfred Chatterton, C.I.E., writes to the *Madras Mail*:—"It was in 1898 that we first started the manufacture of cooking utensils and hollow-ware from imported sheets and ingots of aluminium. The experiment was successful, and eventually the business was disposed of to the Indian Aluminium Company which still carries it on in Madras. But for a long time past, Madras has ceased to be the only centre of aluminium manufacture in India. From information supplied to me by the Collectors of Sea Customs, I have been able to prepare the following table showing the progress of this industry during the last nine years :—

Year.	Imports of aluminium in cwts.	Value in lakhs of rupees.
1904-05	890	1·05
1905 06	1,803	2·06
1906-07	1,964	2·89
1907-08	2,696	3·62
1908-09	3,734	3·21
1909-10	11,740	9·02
1910-11	11,784	9·24
1911-12	21,512	15·21
1912-13	35,809	25·51

Regarding this industry merely as a substitution of aluminium for brass and copper, the economic result is not very important, since it is merely the substitution of one imported metal for another. But it may be assumed that the hygienic qualities of aluminium as compared with brass and copper render its extensive use by the people of India a matter of some importance. Further, from an industrial point of view, the methods pursued in the manufacture of aluminium wares are a complete revolution on the processes formerly employed in metal working and mark a great technical advance. It must be remembered, however, that the main idea underlying our efforts to create a market for aluminium in India was that it was only a necessary preliminary to the establishment of hydro-electric works for the manufacture of the metal from raw material existing in India. It may be safely said, now, that the market for aluminium in India is sufficiently large to justify the establishment of such a factory. It is reasonable to expect that the use of aluminium in India will continue to extend, and in a few years' time might rise to anything from 5,000 tons to 10,000 tons, valued at from Rs. 70 lakhs to Rs. 140 lakhs. The Geological Survey of India has indicated various lateritic deposits as suitable sources of raw material, and on the Western Ghats, there are sites where the water-power can be conveniently developed. The enterprise which has led to the establishment of iron and steel works in this country is amply sufficient to deal with the question of the manufacture of aluminium, and I hope that by prominently drawing attention to the fact that there is now in India a market sufficiently large to justify the establishment of an electrolytic factory, private enterprise will be induced to take up the preliminary investigations necessary for the inception of such a project."

Indian Exports in 1912-13.

Exports of Indian Merchandise in 1912-13 formed 98·1 per cent. of the total exports and about 59·3 per cent. of the total trade in merchandise. The year was a good one for Indian

exports; and, for the fourth year in succession, the total is the largest on record. It amounts to Rs. 241·16 crores as compared with Rs. 221·82 crores in 1911-12 and with an average of Rs. 203·98 crores in the three years ending 1911-12. The further progress made therefore amounted to Rs. 19·99 crores or 9·01 per cent. of the previous year's figures.

The statement below shows the value of the trade in each of the four classes under which articles are grouped in the accounts :—

Unit 1,000.	Average of previous three years.	1911-12.	1912-13.
	Rs.	Rs.	Rs.
Food, Drink, and Tobacco.	57,32,60	68,57,02	78,07,68
Raw Materials and produce and articles mainly unmanufactured.	95,56,99	1,01,47,49	1,03,29,70
Articles wholly or mainly manufactured.	49,16,36	49,50,26	57,33,06
Miscellaneous and unclassified.	1,91,87	2,26,93	2,45,86

The principal articles in the export trade are enumerated below with their values :—

Unit 1,000.	Average of previous three years.	1911-12.	1912-13.
	Rs.	Rs.	Rs.
Rice (including rice-flour).	23,51,07	29,05,18	32,55,79
Cotton, raw	32,33,78	29,52,54	28,11,12
,, yarn and cloth	10,00,22	9,77,89	12,20,04
Jute, raw	17,71,16	22,55,66	27,05,07
,, manufactures	16,69,92	16,00,66	22,87,11
Seeds	24,48,78	28,07,98	22,75,06
Wheat and wheat-flour.	13,67,91	14,14,47	18,77,01
Hides and skins	13,54,44	13,92,85	16,37,07
Tea	12,35,67	12,94,64	13,29,40
Opium	11,72,22	13,08,91	11,22,16
Unspecified food grains.	4,01,43	8,26,30	8,97,32
Wool, raw	2,76,01	2,58,63	2,63,47
Lac	2,30,95	2,01,40	2,11,33
Coffee	1,25,81	1,34,62	1,56,52
Wood and timber	91,17	95,38	1,21,44
Spices	81,57	92,91	93,28
Oils	91,72	1,08,45	85,79
Myrabolans	59,93	50,03	62,14
Provisions	41,90	45,19	48,01
Silk, raw	49,05	45,84	41,74
Indigo	35,43	37,58	22,01

For the fourth year in succession the exports of rice exceeded all records. India is the largest rice-exporter in the world, and her figure this year grew by 12·1 per cent. It largely exceeded any other item in the year under review. Raw cotton cedes the premier place which it had held for three years, and shows a decrease of 4·8 per cent, while shipments of cotton manufactures grew by 24·8 per cent. In cotton and its products there is thus a net advance equal to 2·6 per cent. on the figures for the previous year. In seeds the decline has been remarkable. It approximated to 19 per cent. Raw jute exceeded the record figure of 1906-07, and showed an increase of 19·9 per cent. Jute manufactures improved by 42·9 per cent. The aggregate of the two classes showed a gain of about 29·5 per cent. Wheat and wheat-flour increased by 32·7 per cent., and the class pulses, millets, and cereals not specified made an advance of 8·6 per cent. There was a rise of 17·5 per cent. in the important class of hides and skins. There were increases in the exports of tea by 2·7 per cent., of wool by 1·9 per cent. of lac by 4·9 per cent. and of coffee by 16·3 per cent., while trade in opium and in oils declined by 14·3 per cent. and 20·9 per cent. respectively.

In addition to the articles specified in the foregoing list, there are others which in recent years have generally attained some importance. These are manures with a total Rs. 96·89 lakhs; fodder, bran and pollards (excluding oil cakes) with a value Rs. 113·5 lakhs ; oilcake with a value of Rs. 123·11 lakhs ; Indian metals and ores with a value Rs. 221·67 lakhs ; coir manufactures rising to Rs. 82·57 lakhs ; and raw hemp with Rs. 96·36 lakhs; coal and coke with Rs. 88·39 lakhs, rubber with Rs. 59·79 lakhs and fruits and vegetables which reached Rs. 47·79 lakhs. Salt-petre at Rs. 35·59 lakhs showed an advance of 10·6 per cent after continued contraction.

The Trade in Indian Oilseeds.

The share of seeds in the total value of raw-produce exported (other than food and drink) was 22 per cent. in place of 27·7 per cent. a year before. The total value had grown very

greatly in five years and in 1911-12 exceeded Rs. 28 crores. But the year under review saw a marked reaction in which all descriptions but ground-nuts partook. The prime cause, according to the *Indian Trade Journal*, was the general decline in world's prices which resulted from the large Argentine crop of linseed temporarily held back by a strike, the appearance of Canada as a heavy seller of flax seed, and the overwhelming offers of cheap cotton oil made by Amercian crushers in the early part of the year. Of linseed alone Argentina shipped more by some 90,500 tons or 20 per cent. A factor in the year's business was the increased Eastern demand for soy beans and the resultant higher cost to crushers in Europe. The imports of soy beans into the United Kingdom declined from 222,657 to 188,760 tons. High freights were severely felt. The following statement shows the exports of oil-seeds from India, the unit being 1,000 :—

	Cwts.	Rs.
Average of previous 3 years	29,709	24,48,78
1911-12	30,013	28,07,98
1912-13	24,537	22,75,07

While the quantity of oilseeds exported declined by 5,476,856 cwts or 18·2 percent., there was a net decrease of 19 per cent. in value. The quantities and values of the principal descriptions of seeds exported are shown below, the unit being 1,000 :—

	Average of previous three years.		1911-12.		1912-13.	
	Cwts.	Rs.	Cwts.	Rs.	Cwts.	Rs.
Linseed ...	7,510	8,42,68	10,440	12,96,49	7,090	8,01,85
Rape ...	5,977	4,28,39	4,710	3,51,21	4,357	3,60,52
Cotton ...	5,234	1,94,87	4,073	1,51,91	2,611	1,02,77
Sesamum ..	2,709	2,62,96	1,896	2,02,63	1,557	1,82,37
Groundnut	3,585	2,90,18	3,823	3,18,07	4,867	4,04,18
Castor ...	2,151	1,55,94	2,404	1,76,77	2,213	1,63,83
Copra ...	540	89,12	637	1,13,95	687	1,28,83
Poppy ...	805	81,62	699	74,62	468	55,62
All seeds	29,709	24,48,78	30,014	28,07,98	24537	227507

The article "copra" is now grouped with these, and its inclusion brings India's exports of oleaginous materials to a total of 24,511,424 cwts. with a value of Rs. 22,73 03 lakhs.

Linseed goes chiefly to the United Kingdom (110,316 tons) ; but Belgium with 83,821 tons and France with 70,191 tons are close competitors, while the United States took 8,687 tons only. Germany took 33,170 tons, and Italy 25,608 tons. The largest buyers of rape-seed are Belgium (82,509 tons), France (53,144 tons), and Germany (54,712 tons). Sesamum goes mainly to France, Belgium, and Austria-Hungary ; poppy-seed to France and Belgium ; castor and cotton seeds to the United Kingdom; ground-nuts to France, and copra to Germany.

Of the total exports of oil-seeds, Bombay shipped 46·03 per cent., Bengal 15·03 per cent., Madras 20·6 per cent., and Sind 17·07 per cent.

The world's production of linseed in 1912 was a record and is believed to have exceeded that of the previous year by 1,178,000 tons or nearly 48 per cent. It amounted to about 3,665,000 tons. Of this the Argentine gave 30·8 per cent. with the United States contributing about 19 per cent. while Russia and India vied for third place with 17·7 and 17·5 per cent., respectively. Canada upset the market by suddenly coming in with 14·8 per cent. of the aggregate and something like three times what she usually produces. The Indian crop in 1911-12 was estimated at 642,000 tons against 563,600 tons in the previous year ; and yet the exports show a decrease of 167,533 tons, the decrease being 32·1 per cent. The discrepancy has been the subject of special comment in the trade and suggests either that there has been an unprecedented error in the estimate of the crop or that the low prices offered did not satisfy holders of stocks. The average price in London declined from 69*s.* 10*d.* to 61*s.* 10*d.* The new Indian crop is estimated at 535,700 tons.

The trade in rape-seed, while necessarily feeling the conditions in the linseed and cotton seed markets, showed in London a rise of price from 43*s.* 5*d.* to 48*s.* The spring crop in India for 1912-13 is reported as yielding 1,282,900 tons or 86,300 tons less than in 1911 12. The exports declined by 17,560 tons or 7·5 per cent.

Sesamum is largely consumed in India; and a shortage in it or in rape-seed curtails its exportation. The Indian sesamum crop of 1912-13 was returned at 471,700 tons in place of 397,600 tons in 1911-12; and it should be mentioned that while Burma is not included in these figures since she does not export, and indeed usually buys from India proper, she produces about 110,000 tons herself. The exports of seasmum from all India declined by 17·9 per cent. in quantity and by 10 per cent. in value.

Cotton-seed was a difficult article for the Indian shipper to handle; for the supply in this country contracted from about 1,605,000 to 1,306,000 tons, while crushers in the United States were flooding the Eurpoean markets with cheap oil from the large American crop. In effect, the exports of cotton-seed contracted in value by nearly one-third, and the article now represents only 4·5 per cent. of the total value of oil-seeds shipped and 1 per cent. of the value of Indian raw produce exported. Prices in Europe declined, opened in January 1912 at £8 2*s.* 6*d.* and closed at £8 10*s.*, the highest and lowest quotations having been £9 2*s.*, and £7. The exports in the official year fell by 35·9 per cent. to 130,564 tons. The United Kingdom takes about 98 per cent. of the whole quantity of cotton-seed exported. The crop of 1912-13 is expected to give about 1,800,000 tons of seed.

Poppy-seed feels the competition of cotton seed, and business was again handicapped both by the heavy supplies of American cotton oil and by the progressive contraction of the Indian area under poppy for the production of opium. Exports declined by 33·03 per cent. in quantity and by 25·5 per cent. in value.

Castor-seed exports, on the other hand, declined by 7·9 per cent. in quantity.

The trade in ground-nuts is the only one that shows good progress on the figures now recorded. The growth in exports in 1912-13 has amounted to 27·3 per cent. in quantity. A considerable proportion of the exports of ground-nuts from India is shipped from the French port of Pondicherry and so escapes registration in the trade of India. The exports by that route have been as follows :—

	Tons.	Rs.
1908-09 . . .	50,066	87,17,010
1909-10 . . .	90,042	1,25,43,000
1910-11 . . .	85,137	1,40,46,000
1911-12 . . .	67,083	1,02,73,000

Cash or Credit.

Mr. John Hobbs writes in a recent issue of the *Dixon's Monthly* that whatever arguments may be advanced either for or against a credit system, there can be no doubt that once mutual confidence is established the main feature of business is discovered, and a solid relationship will be the outcome. Mutual confidence is, in fact, necessary in all business transactions where the "cash on the knocker" system is not in vogue, and without it business flags. To establish this feeling is one of the first cares of the man of business, and then the swing is quite easy. Each one, depending upon the other, feels that he can place reliance upon the other's integrity. The accounts can be collected with certainty, and, on the other hand, goods will be delivered promptly. It has been said that the credit customer does not secure as much attention as the payer of cash, nor does he get the same quality of goods, but that is all nonsense in the opinion of Mr. Hobbs. The *Credit* customer is a customer who is secure, and as such will be well treated; the cash customer is here to-day and there to-morrow, and no one knows where the day following.

Another thing to be considered is that cash sales cut profits. The man who demands cash relies upon his quick turnover to reap a benefit. To get this, he has to come down, and, in coming down, plays a gamble with trade. He relies upon the fleeting attentions of the passer-by, and, accordingly, must have quick sales. It is probable that he himself is a man on short credit, and is compelled to hurry up. Perhaps he has no credit at all with the wholesale house, and then he must hurry up all the more.

An argument in favour of cash is that one settled price can be asked, and very little skill

is necessary to get stock of the goods. The returns are quick (they have to be) and the labour of collecting is saved. An expensive system of book-keeping and correspondence is also saved, and the ready cash always needful is always on the leap. Buying for cash and selling for cash is, it is argued, a saving-making system at each end, and shows a clear and easy field always ahead of the retailer. He has a straight path to follow and never can get astray in the wood and lose himself.

Take, on the other hand, an establishment where all kinds of things are sold, especially in art furniture, toys, and so forth. Well, a lady customer would like to purchase a certain thing but she has so much to get at Christmas time.

"Permit me to show you this, madam," says the salesman. "Now, what could be neater. It is just the very thing for your husband, and will come as quite a surprise."

"I am well aware of that," is the answer, "and would be only too glad to buy, but really, if you only knew, and I don't mind letting you know either, I can assure you I have barely cash to go round for all I really must have. Now, I will not take up your time as I know you are busy. I will just select one or two things I can manage and leave you to attend to the rush."

Very considerate of my lady, no doubt, but that is just exactly what the salesman does not want. Here is a customer who openly confesses that she would purchase if she had the ready cash. Surely it is not a very difficult problem for anyone to solve. So, accordingly, he informs her in the neatest manner at his command that she really need not worry on that account, but if she will permit him to send home something he will show her she can call again during the slack time, and so on.

That concludes a very satisfactory arrangement on both sides; simple enough but valueable as an instance serving to illustrate something concerning the credit system. There are establishments which run credit on the "deferred payment" system, and that is but another form of the usual business. Any house, if the security is good enough, will of course, sell on credit terms, only with some persons who have high notions, the monthly collection is objectionable and preference is given to meeting bills.

It has been often remarked and appears to be a widespread belief that good goods cannot be so readily obtained on credit as on a cash sale. "I know, if I have the money in my hand," it is remarked "that I can go where I like and get just what I like; I get the best goods at the easiest rates." That is all very well, and looks reasonable enough from one point of observation, but is it so? Goods exposed for sale are to be sold one way or another, and a salesman will prefer a credit customer to a cash customer for the reason that the former is to a degree a permanent one, that is to-day, it rests with the salesman to make him so, and hold him for good. This should not be a very difficult matter, and the salesman is lucky who can obtain a dozen or two.

Again, the ready cash customer is confronted with another difficulty, and a serious one. He does not confine his attentions to any one place but, of course, with the cash change in his hand goes anywhere. So he is known to many as a casual. Then a time may come (it comes, unhappily, to most of us sooner or later) when the ready cash one requires credit, and the consequence is that his business people hesitate, and naturally so. When such a man seeks accommodation it really means asking for a favour, and as he has himself displayed no interest that way in the past, why should he be considered? Besides, with a strict business man favours are generally discounted at a high rate. The cash customer has never really been a customer. He has gone here and there to suit himself and now he asks the business man to take a risk. It must be a risk because if he were not in straightened circumstances he would not ask for credit. And who, from a business viewpoint, cares about giving credit to a person who is manifestly in an impoverished state, and who previously, by reason of the attitude

of independence which he has assumed, was never regarded as an acquisition by any one house ? He never attached himself to one, and could not be regarded in any other light save that of a come-and-go lot.

If a business man is treated in a cavalier-like spirit one day, it is pardonable on his part to assume the same attitude all along the line. It is a thank-you-for-nothing transaction in every sense of the word. Of course, it is assumed that in every instance, cash or credit, the patron of a business house pays, and does not shirk his obligations, for no one deals with a rogue knowingly.

There is another inducement to pay cash, which is a very strong one, and that is the discount. "We allow you a discount of so-and-so upon this lot if you pay cash on delivery." That sounds well enough to the ordinary household mind, and means a saving. But does it ? The question has frequently been put as to whether or not it is preferable to discount anything at all rather than have a set price ? By offering discount a business man seeks to draw a cash sale. Does he in such a case sacrifice a permanent customer by turning away a name from his books ? The one who makes a bargain that way may or may not come again. He leaves when he has paid and is forgotten as well as forgetting. He is a mere item of the business record and no more. A set price or cash or terms (always supposing the purchaser is sound) to many appears preferable than the complication of reduction in favour of the quick transaction. And, again, the credit customer may elect to think that if the cash dribbler, who, of the go-as-you-please order, is given a favour, why not become a cash payer likewise and go elsewhere or anywhere ? This would certainly entail a distinct loss, for it covers an uncertainty, and anything implying a doubt must be a losing transaction. Why not a set price, cash or credit, if the credit is sound ?

Take a houseful of furniture as an instance. It is purchased on the time payment system of regular instalments. Some say that the stuff one gets on time payment is so poor that by the day it is paid for it is all to pieces. But that condition of affairs could not surely result in dealing with a respectable house. Then, again, the business man will hold that he takes a risk in dealing with strangers who are furnishing, but, as a rule, it is the stranger who is to be considered, for one who has been born and reared in a particular district does not always go to a business man, and set up housekeeping all at once. He has many other ways of doing so, and does not become a fresh customer.

Take, as an example, the man who on a fixed salary holds a secure position. He desires to furnish. He can pay cash, for he has a little put by. But he considers it preferable to be accommodated out of his salary, even if he lives up to every penny of it, and retain what he has in hand for possible happenings. That man, paying on regular instalments, continues on the books permanently. He is always wanting a fresh lot and keeps on living within his income. He argues that if he spent what he has in the bank he would no longer be a solid man but a man of straw, with nothing to recommend him save his weekly salary, which, to do him justice, is no more than the truth. If he is of the saving or the careful order, he may bank each week the amount he would pay to the business house. But every man cannot do that ; very few of us are able to do so, in fact. The money will about go round and that is all. Again, the purchaser on the deferred payment system is insured. The cash man is uncertain on the subject. He becomes neglectful and puts it off. It is an unwise thing to do, doubtless, but then you know we are not all worldly wise. So the credit house is secured that way at least, and his customer is secured also.

A good credit house which has worked up a large private connection, holds regular incoming payments, which represent big figures every month, and if the customers are worth their salt, they do not wait for the collector but come along of their own accord. When they find set prices, there is always the chance of a few small cash transactions ensuing, which amount up to a great deal at the end of a year. A customer who calls to pay his dues must think, once he is inside the house, that he might as well spend his small change there, where he is known, and consequently can rest assured that he will be suited, as go to a strange place where he is not so certain of being obliged. And if there is something which he has seen somewhere else, but which his house has not on the counter, what is easier than to mention the circumstance and have it sent home ?

Thus he has the firm ready to oblige him, and an understanding is arrived at very soon. Friendly relations are, in fact, established, and such are always mutually profitable. If there is a grievance it can be remedied, if the satisfaction is not full, then it will be made so. No business man can afford to lose a customer.

Openings for Business.

[For particulars, address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle]

WOOLLEN, COTTON AND SILK PIECE-GOODS.

A firm of importers in India desires to get into touch with manufacturers (in Bradford and Manchester, Germany and France) of woollen, cotton and silk piece-goods. (B264)

PODOPHYLLUM EMODI.

A firm in Lahore is desirous of communicating with exporters in Calcutta of roots of *podophyllum Emodi.* (B265)

KASHMIR EMBROIDERIES.

A firm in Kashmir is desirous of communicating with importers in foreign countries of Kashmir embroideries and embroidered Numdah Floor Rags. (B266)

INCANDESCENT MANTLES.

A Madras firm is desirous of communicating with (1) makers of machinery for the manufacture of incandescent mantles, and (2) with an expert capable of managing an establishment for manufacturing incandescent mantles. (B267)

MICA MINES.

A firm in Giridih, Bihar, is desirous of communicating with parties who are in a position to sell or lease out mica mines. (B268)

EMPTY BAGS, BRISTLES, COFFEE, TEA AND RICE.

A dealer in Jaffa is desirous of communicating with exporters of empty bags, bristles, coffee, tea and rice, who wish to be represented in the districts of Palestine and Syria. (B269)

ELECTRICAL MACHINERY.

A Manchester Engineer is desirous of corresponding with importers of electrical machinery, materials and supplies with a view to being appointed as agent for the purchase and inspection of such goods in the United Kingdom. (B270)

FIREBRICKS AND FIRECLAY.

A firm of manufacturers in Sweden is desirous of appointing an agent in India for the sale of firebricks and fireclay. (B271)

FIREBRICKS AND FIRECLAY.

A firm of manufacturers in Sweden is desirous of being placed in communication with importers of firebricks and fireclay. (B272)

RAGS.

A merchant in Southern India is desirous of getting into touch with buyers of rags. (B273)

CREAM SEPARATORS.

A Glasgow firm is desirous of appointing agents in India for the sale of a new cream separator. (B274)

WASTE RUBBER.

A Bombay firm is desirous of getting into touch with shippers of waste rubber. (B275)

BUILDING MATERIALS, ETC.

A merchant in England is desirous of communicating with firms disposed to appoint a buying agent in London for building, mining and railway materials; hardware, electrical plant and brass and copper tubes, plates and rods, etc. (B276)

WOOD-WORKING MACHINERY.

A firm in England is desirous of appointing an agent for the sale of wood-working machinery in India. (B277).

WOOD PRESERVATIVE.

A Brussels firm is desirous of appointing an Agent who could introduce amongst Railways in India a patented wood preservative. (B278)

ASBESTOS.

A firm in Leeds is desirous of appointing an Agent for the sale of Asbestos in Calcutta. (B279)

ARTIFICIAL SILK THREAD.

A firm in Secunderabad is desirous of communicating with manufacturers in Europe of artificial silk thread. (B280)

RICE BRAN.

A Madras firm is desirous of getting into touch with buyers of Rice Bran. (B281)

The Economic World.

Land Revenue Settlements.

IN the Madras Provincial Conference held at Trichinopoly last month, the Resolution in regard to land revenue settlements led, as in last year, to an animated discussion as to whether the Conference should press for a permanent settlement or for long term settlements based on equitable principles of enhancement. Logically, says the *Hindu*, there can be no doubt that the demand for a permanent settlement is the only correct position for the Conference to take up, but "we do not see that there is necessarily much harm by tacking to it a demand that, if periodical settlements continue to exist, they should be only once in 60 years and that enhancements should be limited to a certain maximum percentage at each revision. We cannot, however, understand the argument used by the Hon'ble Mr. T. V. Seshagiri Iyer in opposing the amendment, that considering the growing responsibility of the administration, it was too much to ask that the Government should be content with their resources permanently fixed The obvious question to ask on this curious plea is, is any other modern Goverment in Europe or elsewhere, depending upon its proprietory rights in land for its resources? How can the financial resources of any Government become permanently fixed merely by settling the land revenue permanently? It is a fundamental maxim of sound finance that the financial resources of Government should be strictly limited by its needs, and that when fresh needs arise and increased responsibilities accrue, only then, should fresh taxation be resorted to. If the responsibilities of the Government are growing and cannot be met out of existing sources, there would be nothing to prevent the Government then to come forward and propose by a new fiscal enactment to tax, not lands only, but any other sources of wealth or income, which might justly be called upon to meet the expenditure. The confusion results from and the evil is inherent in dealing with land revenue, not as a species of taxation, but as a share of joint proprietory income which continues to grow and fill the coffers of the State, whether it needs it or no; and until land revenue is placed under the cotrol of the Legislature, as effectually as all sources of taxation are in all constitutional countries, it is the plain duty of the representatives of the people to fight for the abrogation of the principle that land revenue is a species of rent levied by the state from its tenant occupiers, and liable to be enhanced at the instance of the executive without reference to the financial needs of the Government."

The Need for an Economic Enquiry.

One of the very best portions of the Presidential address of the Hon'ble Mr. M. Ramachandra Row at the Trichinopoly Provincial Conference is that dealing with the economic condition of the agriculturlist. Mr. Ramachandra Row said:—

For a good long time this Conference has been raising its protest against the principle of the land revenue settlements in this Presidency. The Indian National Congress year after year has also discussed the subject *ad-nauseum*. The periodical revisions of the land settlement and the principles upon which the re-settlements are conducted, have formed the subject of anxious enquiry in the past. The Land-revenue Policy of the Government was reviewed by Lord Curzon in 1903 and the economic condition of the ryot has been the bone of contention between two opposing schools of thought. Since the reformed Councils came into existence, the matter has been pressed upon the attention of the Government both in the Imperial and the Provincial Councils, in some shape or other. In a country like India where the mass of people live by agriculture, an assessment of 50 per cent. of the net profits will leave very little to the cultivator and any

substantial change for the better in his economic conditions is *prima facie* not possible. I do not think the time at my disposal will enable me to cover the whole ground in regard to the principles of land assessment or their application to re-settlements in recent years. But I would invite your attention to certain features of this question, which call for an exhaustive and careful enquiry into the economic condition of the ryot. The total number of single and joint pattas in this Presidency (the latest available figures of fasli 1315) was 5,851,699. Of these, those paying an assessment of Rs. 10 and less amount to 2,454,697, *i.e.*, far above a third of the total number of pattadars, and they hold approximately a little more than one-fourth of the total occupied area in this Presidency. It will be seen therefore that nearly one-third of the cultivators of the soil paying an assessment of Rs. 10 and less and in possession of nearly a fourth of the occupied area, have to subsist solely upon what they can make out of the soil. I do not wish to complicate the case by a consideration of the condition of the ryots who pay more than Rs. 10 as annual assessment to the State. But confining our attention to the one-third that pays Rs. 10 and less, can it be contended that their position is anything but that of the most abject poverty and that the Government are pursuing the right policy in demanding from these hereditary tillers of the soil 50 per cent. of their net earnings from the land? If a person pays an assessment of Rs. 10, the procedure adopted at the settlements indicates that his net profit allowed to remain in his hands, is an equivalent of the assessment, but even on the assumption that a man who pays Rs. 10 as assessment is likely to save Rs. 20 after excluding the assessment, there remains the fact that the assertion made on behalf of the Madras Government that the ryot lays by the profits of a good year to meet the demands in a lean year cannot be made out at least in the case of one-third of the agriculturists in the Presidency who cultivate their holdings. The fixed recurring demand of 50 per cent., in the case of these ryots, is one of the greatest economic evils of this Presidency. It is urged that the ryot has the benefit of the rise in the prices, but this certainly cannot be a help to this class of cultivator whose produce from the land will in many cases not be enough for his domestic requirements and even if he gets more for his grain, he has to pay more for what he purchases. In dealing with the co-operative movement I have referred to the extent of loan transactions evidenced by mortgages below Rs. 100 and stated that the bulk of the transactions coming before the Registration officers belong to the poorer classes. It will probably be found on investigation, that most of these belong to this class of agriculturists. It is conceded that the larger interests of the people require that the burden of the State on the land should be lightened, and it is necessary, therefore, that the policy of the Government in regard to the period and principles of revision settlements will have to be modified without any wide departure from principle, to give relief at least to the poorer classes of agriculturists. The whole question of the economic condition of the agricultural population of this Presidency requires a thorough investigation by a mixed committee of officials and non-officials. An investigation such as that, conducted even in a few selected villages in the different groups of districts, will be of great assistance not only in a correct appreciation of economic questions of the day, but also in securing the reconsideration by the Government of India and the Secretary of State of the principles of land assessments laid down for a long time.

The Fight with Poverty.

The *Indian Spectator* writes :—Poverty has been defined to be an insufficient supply of those things which are requisite for an individual to maintain himself and those dependant upon him in health and vigour. With the same income, therefore, one family may be above and another below the line of poverty. A family may require more in one climate than in another. In the richest countries, so called because of the total quantity of wealth per

head of population found in it, an enormous amount of poverty may for various reasons exist. One of His Majesty's ministers said the other day that his country, "the richest the world had ever seen, did not provide its children, who had maintained and built up its glory, enough to keep themselves and their families above a state of semi-starvation." In the United States, another rich country, it has been calculated that not less than ten millions of people are in a similar state. Every civilised Government is engaged in a fight with poverty, sometimes directly and consciously, and at other times indirectly and unconsciously. It will be instructive to enquire how the war has been carried on in this country, which is admitted by all to be among the poorer countries of the world, and how it may be carried on in future.

Students of poverty attribute it generally to three causes—insufficient production, uneconomical consumption, and imperfect distribution. The first condition necessary for the production of wealth in a country is the protection of person and property; for no one will toil to produce what he may not be able to possess and enjoy. Under the British flag, where peace reigns supreme and security of person and property is enjoyed in a measure unknown in former times, poverty is gradually receding, and success of the war will depend upon the wisdom and perseverance of the citizens who must fight under that banner. Production of wealth has been increased by bringing new areas under the plough, and cultivation has extended so rapidly that in their eagerness to supply their own necessaries, the people may trench upon grounds which must be set apart for the benefit of their cattle. Production must now be increased in a different way. 'The land must produce twice what it did' said a British statesman the other day; so it must in India. The irrigation works, on which the Government is spending and will continue to spend over 2,50 lakhs every year, and which have already converted thousands of acres of wilderness into smiling fields, have done much to increase the produce of the land. The department of agriculture in every province is engaged in finding out and bringing to the notice of the people what new processes may be adopted and new crops may be grown, how cattle may be preserved and their breed improved, and how the insect-enemies of the agriculturist may be destroyed or held in check. The medical and sanitary departments are engaged in a war against those diseases which not only carry away victims that are not fit to live, but sap the strength and vitality of those who are fit to work and produce wealth. Manifold are the advantages of education and the Government has decided to open thousands of new schools every year all over the country, so that in course of time education may be brought within the reach of the poorest. The people must realise that its object is not to teach the poor to avoid work, but to enable them to improve their economic condition by more efficient means.

That which is produced must be consumed without causing waste. Every form of expenditure which does not produce wealth cannot in practice be treated as waste. An English student of poverty has written that our lawyers may be estimable individuals, but if they analyse the nature of their services, they must come to the conclusion that the less those services are required the better will it be for the community. Military expenditure is also said to be waste, in that it is unproductive. Many lawyers and other public men in this country argue that the employment in the public service of a large number of Europeans is uneconomical, and hence conducive to the impoverishment of the country, to the extent of their remittances to England and the pensions which they spend abroad. But we cannot dispense with lawyers, soldiers, administrators and others in the present condition of society. Their number or their remuneration may perhaps be somewhat reduced here and there, but to ensure the uninterrupted production of wealth and its peaceful enjoyment the nation is obliged to employ services which must be remunerated.

The landlord, who benefits by the services of labourers and watchman, cannot grudge to recompense them because they take away their wages to their own homes, and to that extent impoverish him. It is a very common belief that our public works, however necessary and useful they are, involve some amount of waste. But public waste, whatever its extent, is not a potent cause of poverty in this country, such as should disturb us seriously in our efforts to increase the wealth of the land, and make us imagine that the irrigation of the field is useless because some water percolates into the deeper layers of earth.

The distribution of necessaries is becoming more and more perfect under the British Government. The public roads, the railways the steamships, aided by the telegraph and the post office, help in the free circulation of wealth and necessities of life, besides providing labour to a large number of poor people. The internal as well as external trade of India grows by leaps and bounds. Trade not only stimulates production, and supplies work to the poor, but enables them to provide themselves with necessaries in exchange for what they may require less urgently.

H. E. the Governor of Bombay said truly sometime ago that the mission of the British in India is "continuous amelioration." We often forget how much of this amelioration is really a fight with poverty, and it is sometimes so far forgotten that we may be told that poverty is actually increasing in the land. This statement is contradicted by all experience. It is only during a famine, when relief works are opened and railways pour in food and fodder from all directions, and officers and others are hard at work, that we are reminded what a campaign against want means. As a matter of fact, this war is on a less conspicuous scale carried on continuously. New methods of warfare are now and then introduced, for example, the co-operative movement. In Europe the poor people are learning to achieve remarkable results in the production and distribution of wealth by means of co-operation. The campaign against poverty will be more and more successful if the people follow the lead given by the Government experts, take advantage of the knowledge placed at their disposal, modify their customs and habits which lead to waste of money, time and energy, and co-operate with officers and with one another to promote their own well-being.

What Protection costs Germany.

The following is the chief part of an article which appeared in the *Frankfurter Zeitung* on March 28th. In view of constant appeals made by Tariff Reformers to the example of Germany and her scientific tariff, our readers would like to see the opinion on the subject of one of the most authoritative newspapers in Germany. Says that journal .—

The lengthy and earnest discussion of the proposed direct tax for armament purposes of 1,000,000,000 marks (£50,000,000), will have one result for which the German people should be grateful to the Government. It will result in *a searching examination of the fundamental principles of German financial policy.* The proposal to impose for military purposes *in time of peace* a direct tax of a kind that has never been imposed in actual war, and hardly ever even after a defeat, is a confession that the poorer classes in Germany have to bear a financial burden which has reached or passed the limits of human endurance. The inevitable result is that the whole of our economic policy, and above all, our tariff system, must be seriously questioned.

Why Protection was Introduced.

The German system of high protective tariffs has for years been glossed over by high-sounding phrases like "the protection of national industry against foreign competition." It is only when the abolition of the system is mooted that appeal is made, and then only occasionally, to its fundamental function as a means of raising revenue. Thus it was only when the Left demanded the abolition of taxes upon foodstuffs in the interest of the working classes, and the naked opposition of the interested class of great land

owners to the working classes became evident, that we were told of our precarious financial position and the consequent impossibility of removing the tariff. We have fallen into the habit of separating economic and financial policy; even to the point of regarding tariff-revenue as a heaven-sent bye-product of our economic system. Such a point of view is historically absolutely false. When Bismarck introduced the system in 1878 economic aims were with him a minor question. Bismarck's aim was purely political. The Liberals were then too strong for him; the National Liberals were unruly in obedience. Bismarck had to seek a new majority. By the introduction of the tariff-system he replaced the struggle of political convictions by "a struggle of interests at the feeding-trough." He united the interests of the great landowners and the great manufacturers to form a combination which crushed the political parties and ensured an obedient following for the Government. This was Bismarck's paramount aim in introducing Protection. His second aim—and also the aim for which he needed the majority—was revenue. The young Empire was in financial straits. It needed an increase of income of 250 million marks (12½ millions sterling). The Bundesrath would not dream of direct taxation. Tariffs only were left. Protection was to enable the Empire to stand on its own feet, and provide an ever-increasing source of income to meet every future need.

A Disgraceful Fiasco.

The greatest supporter of our protective tariffs cannot deny that from the point of view of this aim they have proved a disgraceful fiasco. The wheat and rye tariff, originally 1 mark per double centner (1s. per 2 cwt.), rose in 1885 to 3 marks—a rate which Bismarck himself had said was iniquitous—and is now 5½ and 5 marks, and, if the farmers' union had had its way, would be 7½ marks. *Germany from being a country where living was cheap, has become perhaps the dearest country in Europe.* In recent years the increase in price of all commodities, and particularly of the necessities of life, has become intolerable. But the revenue shows no corresponding increase In spite of higher tariffs the imperial finances have remained precarious. The National Debt has increased by 50 millions sterling in the last decade. Financial refo m has followed financial reform till the last blood-letting in 1909; and now we are again at the end of all things. The new extraordinary tax on property is evidence.

How Great Britain Faced a Similar "Fiasco."

Such a state of affairs is fraught with every anxiety for a country such as Germany, which has, during the last two decades, owing to the intelligence and application of her people (and in spite of her economic and financial policy !), shown an increase of industry surpassing even that of the United States. But the fiasco is not an entire surprise. In the middle of last century Great Britain had to face just such another. Then everything was taxed and expensive in England and, in spite of all, indebtedness increased, and the Budget deficit grew more serious every year. In 1840 a Commission was appointed to inquire into the system. It found that 94½ per cent. of the tariff revenue came from seventeen taxed commodities, 3·9 per cent. from twenty-nine other taxed commodities; while 531 other items together produced only £80,000.* This discovery was the end of the protective tariff system in England. Then followed, in the next twenty years, from Peel to Gladstone, *that Free Trade finance policy to which England owes the very lifeblood of her national finances and the decrease of her National Debt.*

Protective Tariffs Ruin Finances.

We are exactly in the same position to-day in which England was a half-century ago. We have screwed our tariffs up and up, and our revenue has got steadily worse. *We must get rid of our tariffs if we would make our finance sound. Protective tariffs ruin finances. They increase expenditure.* Empire, State, community must pay more for the articles they buy. Like any other consumer they must pay for

the iron-tariff in higher prices for railway material and battleships; for food-taxes in the higher cost of supporting the army and the civil officials. Protective tariffs ruin finances above all because of the ever heavier burden laid on the people, a smaller and ever smaller proportion reaches the Imperial Treasury, while the lion's share goes into private pockets. Protective tariffs raise the price of imported goods. The importer pays to the foreign producer the international market price, and pays to the revenue authorities the tariffs at the boundary. This portion of the increase in price caused by tariffs goes to the Imperial Treasury.

WHAT PROTECTION COSTS GERMANY.

But *tariffs also increase the price of goods produced in the country,* since the native manufacturer need not sell cheaper than his foreign competitor, and of this greatly preponderating portion of the increase in price due to tariffs not a farthing reaches the Treasury. Brentano reckons that the tariffs on cereals during the years 1907-1909 increased the price of bread by a yearly sum of 1,020 million marks (51 millions sterling), while of this sum only 126 million marks (£6,300,000) reached the Treasury. The remaining 894 million marks went into the pockets of a few privileged landowners, to whom every year the German people pays a sum equal to the proposed extraordinary tax of a thousand million marks, which the capitalist classes are now to pay once as an extraordinary centenary gift towards the cost of defence! It is exactly the same with the tariff on iron. The revenue from this tariff is a minimum, because the import of iron is minimum. The Pig-Iron Syndicate is, however, placed by the tariff in a position to impose a private tax on the German consumer until the cost of the German iron is almost equal to the cost of the foreign iron plus tariff plus freight.

THE LIMIT OF ENDURANCE.

Examples could be multiplied. The result of the German protective tariff system is that our finances are precarious, a great—intolerable—burden is laid on the people, and a yearly present of hundreds of millions is made to a tiny group of private persons. *We have reached the limit of endurance.* Fresh indirect taxes could not be borne. This the Government has recognized by calling upon the propertied classes for an extraordinary contribution. But direct taxes in the long run will only be supportable and productive when we have set to work to abolish protective tariffs which have the effect of private taxes. The financial necessity of the Empire, the States and the communities, as well as the economic working of our tariff-policy, *is forcing us ever more and more to a complete abolition of the system of protective tariffs.* The latest demand for national defence will reveal this to the people at large; and thus the new proposal will prove a blessing in disguise.

Is the Price Level Controllable?

In the *Modern Review* for May, Mr. H.K. Rakshit of Wisconsin, U.S.A., has summarised the views of Prof. Fisher of the Department of Political Economy in the Yale University. Prof. Fisher believes that he "has a practical remedy for the steady and inexorable rise of prices, popularly called the high cost of living." It is certainly worth while to consider the remedy which this veteran rising economist of America has discovered after a thorough research of many years. It is for this reason his ideas are introduced to the reading public mostly in his own words.

Various causes of high prices have been discovered ranging from Trusts and Tariff down to the American hen; but the following are the most generally accepted—

1. Increasing Gold Supply.
2. The Trusts.
3. The Tariff.
4. The introduction throughout the world of better standards of food, sanitation, and clothing.
5. The growing demand for luxuries, and, in the U. S. at least, an increase in "the spirit of extravagance and wastefulness."

According to Prof. Fisher all of these causes, except the first one, might be removed by legislation and education. To him, and to many other economists of the day, the cause of the increase in prices or the increasing cost of living is found in the enormous increase in the gold supply, all other factors but play a very insignificant role in raising the price level. The purchasing power of money is continually decreasing with the increasing gold supply.

Money performs two profoundly important functions in the complex society of modern civilization. It serves as a token of exchange and as a measure of value. The clear distinction between these two functions of money was clearly drawn, for the first time, by Mr. Turgot, the great Finance Minister of France in the middle of the 18th century. Leon Say, in his essay on Turgot, reports the French Minister's theory of money in the following passage :

"Before gold and silver had become the pledge representing every kind of wealth, exchanges, according to Turgo, were made in kind. Measures of wheat were given in exchange for measures of wine. The competition between those who had more or less need of a given commodity determined the current value of each commodity relatively to all the rest. Any commodity could thus become the equivalent of any other, and could be used as a common measure for comparing other commodities. A given quantity of wheat worth eighteen pints of wine would likewise buy a sheep, or a piece of tanned leather, or a certain quantity of iron : thus all these things had in trade the same value. But not all pints of wine are of the same value ; and if 18 pints of Anjou wine will buy a sheep, eighteen pints of Cape wine will buy several sheep. In order to avoid the confusion resulting from the application of the same term of things of variable qualities, it was found necessary to chose as a measure of the value of other commodities a commodity always identical, easy to transport, and capable of being preserved without alteration."

Such a commodity was found in gold and for a time it served the purpose admirably because the production of gold was then too small to affect the purchasing power of money. But with the discovery of gold mines in California and Australasia and the improved mining method, the stock of gold has greatly increased. Now, gold is not a fixed measure of commodity prices, but a very unstable one. The effect of this everchanging value of gold is well expressed by Fisher :

"A laboring man who put $ 100 in a savings bank fifteen years ago and now withdraws his $ 150 fondly imagines that he has fifty per cent. more than he put in, but when he comes to spend it he finds that his whole $ 150 will buy no more than his original $ 100 would have bought in 1896. In other words, the depreciation of gold has tricked him out of all his interest. Naturally he is discontented and wants to attack something. He does not much care what. He is one of the millions of victims of a shrinking dollar, just as 20 years ago his father may have been one of the millions of victims then suffering from an appreciating dollar."

"Instead of a standard which first benefits the creditor at the expense of the debtor, and then benefits the debtor at the expense of the creditor, let us have a system which gives a square deal to all."

"We have standardized every other unit in commerce except the most important and universal unit of all, the unit of purchasing power. What businessman would consent for a moment to make a contract in terms of yards of cloth or tons of coal, and leave the size of the yard or the ton to chance? Once the yard was the girth of a man. In order to make it constant we have standardized it. We have standardized our new units of electricity, the ohm, the kilowatt, the ampere, and the volt, but the dollar is still left to the chances of gold-mining."

There exists no natural standard of measure in this world. Almost each nation has got a standard of its own but they are all

Government-made. For example, at Washington there is an actual scientific measure of a meter, made of platinum, and is highly taken care of from heat, cold and other climatic changes. A similar standard is carefully preserved by the English in the tower of London and by the French in Paris. Prof. Fisher here urges for a universal and scientific standard of money. And how can this be attained? Prof. Fisher's proposal is.

"By means of statistics called 'index numbers of prices.' Such statistics are to-day published by the London '*Economist*'; the United States Bureau of Labor, the Canadian Department of Labor, and several commercial agencies such as Bradstreet's. The index number of the Bureau of Labor is based on the wholesale prices of 257 commodities, and shows from year to year the extent to which prices on the whole advance or fall...The index number shows the average amount for all the 257......A Statistical Bureau, as for instance the present Bureau of Labor or an International Statistical Office, would compile and publish these statistics periodically and the actual prices on which they are based. If at any time the official index number showed that the price level had risen one per cent., this would be the signal of increase of one per cent. in the virtual dollar."

It is necessary to explain here what Prof. Fisher means by the phrase "virtual dollar." In his own words again:

"Briefly stated, the plan is virtually to increase the weight of the gold dollar......The aim is to compensate for losses in the purchasing power of gold by virtually putting more gold into each dollar. As fast as each grain of gold loses in purchasing power, the loss is offset by adding the necessary number of grains of gold to the dollar."

He goes on further to say, showing thereby that if this scheme is adopted throughout the world, the purchasing power of the money will remain stable. He says:

"An increase in the weight of the dollar would tend to increase the purchasing power of the dollar and to reduce the scale of prices. Evidently if we can find some way to increase the weight of the dollar just fast enough to compensate for the loss in the purchasing power of each grain of gold, we shall have a fully 'compensated dollar,' that is, a dollar which has constantly restored to it any purchasing power it may lose by gold depreciation......We have now a dollar of fixed weight but varying purchasing power. Under the plan proposed, we should have *a dollar of fixed purchasing power but varying weight.*"

It seems impracticable to adjust the gold coin by continually recoining it to the varying values of gold bullion. But Mr. Fisher finds a remedy here, too.

"Existing gold coins would remain unchanged.........and new gold coins would simply become what the silver dollar now is, token coins. Or, better, they would be, like gold certificates, mere warehouse-receipts, or, as it were, 'brass checks' for gold bullion on deposit in the treasury. Otherwise expressed, *gold coin would be merely gold certificates printed on gold instead of on paper*. They would be used exactly as gold certificates are used—namely, issuable to the gold miner in return for his bullion, and redeemable for those who wished bullion for export or in the arts."

In a sense, observes Mr. Rakshmit, Prof. Fisher's plan may be described as a plan to restore the ancient custom of seiniorage on gold coin.

It would be readily acknowledged that the measure in use in money transactions to-day is hardly scientific. Industrial and commercial panics are largely due to the acclivitous and declivitous tendencies of our measure of value. Unless a stable unit is discovered the world is sure to suffer from the evils of our ever-shifting measure of value. It is a good sign that there there is a bill before the U. S. Congress for the establishment of an international conference on the cost of living. And in this conference Prof. Fisher's plan for creating "an unshrinkable dollar" requires grave consideration and minute criticism.

The Financial World.

U. S. Currency Bill.

THE United States Government Currency Bill has been introduced. It provides for gradual withdrawal of National Bank Notes and their replacement within twenty years by Federal Reserve Notes and the withdrawal of seven hundred million dollars of 2 per cent. Government Bonds, on which the note issue rests. The Federal Reserve Notes will be secured on a gold reserve of $33\frac{1}{3}$ per cent. provided by Regional Federal Reserve Banks and will be the first lien on the assets of all these Banks. These notes will be issued at the discretion of the Federal Reserve Board, solely as advances to Reserve Banks. Bankers are already strongly opposing the Federal Reserve Board and Regional Reserve Banks on the ground that the Board will be politically controlled and will thus open the door to Manœuvring Funds for political purposes. They advocate instead a Central Reserve Association, subject to Government control.

The Indian Finance Commission.

The Royal Commission on Indian Finance and Currency have decided that the question of the Coinage of gold in India and the establishment of a State Bank fall within their terms of reference. The Commission hope that they will hear in London representatives of all branches of Indian opinion and they do not propose to visit India.

The following non-official gentlemen resident in or connected with India have been invited by the Royal Commission on Indian Finance and Currency to give evidence before them in London :—The Hon'ble M. de P. Webb, C.I.E., Chairman, Karachi Chamber of Commerce; Mr. D. M. Dalal, bullion broker, Bombay; the Hon'ble Mr. G. K. Gokhale, C.I.E.; Sir A. McRobert, Managing Director, Cawnpore Woollen Mills; Mr. T. Smith, Agent, Allahabad Bank, Cawnpore; Mr. L. G. Dunbar, Secretary and Treasurer, Bank of Bengal; Mr. W. B. Hunter, Secretary and Treasurer, Bank of Madras; Mr. R. Sundaram Iyer, Secretary, Madras Economic Association; Pandit Vidya Sagar Pandiya, Secretary, the Indian Bank, Ltd., Madras; Sir Vithaldas Thackersey; Sir Sassoon David; Mr. Chuni Lal Suraiya, Managing Director, Indian Specie Bank; Sir Danie Hamilton, of Messrs. Mackinnon Mackenzie & Co., and Mr. H. M. Ross. The witnesses will be paid first-class passage and one guinea a day during their stay in London.

Bengal Chamber of Commerce's Views.

The following are some of the views expressed by the Bengal Chamber of Commerce in a letter to the Indian Finance and Currency Commission :—The existing currency system is working satisfactorily. It deprecates changes which may, or may not, be calculated to strengthen and to improve it. The recommendations are :—(*a*) that a Gold Standard Reserve should be held in London; that no maximum limit should be fixed in respect of it; that a portion of it should be invested in gold securities or placed on short loan as at present, and that, at least, £5 millions should be held in gold; (*b*) that the existing system, whereby the Secretary of State sells the Council Bills and transfers in excess of his needs in order to meet the convenience of trade, should be continued; (*c*) that the practice of loaning some portion of the Government balance to bankers at interest is reasonable and should be continued; (*d*) that no steps should be taken at present in the way of coining gold, either in sovereign, or any other gold piece in India, and (*e*) that should it be decided, for reasons of sentiment, to coin gold, a branch of the Royal Mint should be established in India for the coinage of British sovereigns and that no attempt should be made to introduce any other gold coin into India.

The Mysore State Bank.

The subject of creating banking facilities for the development of trade and industries within the State by utilizing local capital as far as possible, has been engaging the attention of His Highness the Maharaja's Government for some time past.

After having given the subject full consideration, the Government of His Highness the Maharaja are of opinion that the formation of a State-aided Bank to be called 'The Bank of Mysore' with its head quarters at Bangalore is desirable.

The Government will be pleased to grant the following concessions to the Bank when started :—

(i) The Government to maintain in the Bank, for a period of ten years, a minimum balance of half the paid-up capital, without interest, not exceeding five lakhs and to deposit another equal amount at a reasonable rate of interest, that is, not less than 3 per cent. per annum, if required by the Bank.

(ii) The Government to pay half the working expenses of the Bank for the first five years and this contribution is not to exceed Rs. 10,000 per annum unless the special sanction of the Government is obtained to increasing the working expenses to more than Rs. 20,000 per annum.

(iii) The Bank to be permitted to do at district head-quarters and other places approved by Government, such treasury work as may be decided upon from time to time.

(iv) The Bank to be given preference, as far as possible, in the matter of deposit of securities to be hereafter purchased by Government.

(v) The Government to supply treasury guards within the State and free escort for remittances between places not connected by railway for a period of five years and thereafter on payment of a reasonable charge, the Government not being held responsible for losses by theft, negligence, etc.

The Bank, on the other hand, will be required to consent to the following conditions. The concessions mentioned in the foregoing paragraphs will continue only so long as these conditions are satisfied :—

(i) To employ or invest or otherwise utilise at least 50 per cent. of the capital, deposits and other funds at the disposal of the Bank within the limits of the Mysore State including the Civil and Military Station.

(ii) To appoint a duly qualified banking expert with the approval of Government to manage its affairs.

(iii) To its accounts being audited once a year, or more frequently by a person appointed by Government and to furnish Government as promptly as possible with all information and explanations and to produce for inspection of such person all accounts, documents, securities and other property of the Bank, as Government may require.

(iv) To obtain the approval by Government of the appointment of the President of the Directors.

(v) To publish such accounts as the Government may desire in the *Mysore Gazette* for the information of the public.

(vi) Not to engage in or enter into operations connected with foreign exchange.

(vii) Not to lend money on the security of immovable property.

(viii) To give due consideration to any advice that may be tendered by Government concerning the management of the business and employment and investment of the funds of the Bank.

In order to issue the necessary prospectus calling for shares, collect the required capital, and to take necessary steps to bring the Bank into existence and to put it into working order, certain gentlemen each of whom has expresed his willingness to take shares in the Bank to the extent of Rs. 5,000 at least will form a Provisional Directorate. The initial expenditure will be raised by the Provisional Directors amongst themselves and on the formation of the Bank, they will be entitled to recoup themselves either in shares or in cash and receive such promotion money as may be agreed to by the share holders and approved by Government.

The capital of the Bank should be not less than 20 lakhs but operations may be started when the paid-up capital amounts to 5 lakhs. As soon as the Bank is started the confirmation of the Directors or the appointment of new Directors and the management of the Bank will vest in the shareholders as is usual in such cases.

The Government have no objection to these concessions being widely circulated in the prospectus and otherwise and to the advertisement of the fact that the institution is under the patronage of and in receipt of aid from the Government of His Highness the Maharaja. But it should be made clear to all concerned that the entire liabilities as well as the entire profits of the concern will be the shareholders' alone. A note to this effect should be printed in the prospectus and on the back of the share application forms both in English and Vernacular.

The Government will, if required, for at least a year at the commencement, make available to the management of the Bank, such expert advice and co-operation as may be necessary to ensure its smooth working and development on sound business lines.

The Secretary of the Economic Conference will actively co-operate and do all that is necessary to help the Provisional Directors to bring the Bank into existence. An officer of the Account Department will also be associated to give advice in the initial stages of the organization.

A Bibliography of Indian Finance and Economics.

The following contribution to the *South Indian Mail* by "Barnalist," will be found useful by all who may be interested in Indian Finance and Economics :—

Finance has fascination for certain minds and the recent discussion in India and England about Indian Finance and financial methods has made it abundantly evident that there are a large number of men who are interested in the subject. Those who have devoted care and attention to this range of questions are no doubt acquainted with the vast literature dealing with them but there is a larger group who though intensely interested in them find a real difficulty in beginning the study. Specialists know in what directions investigation may be profitably conducted but it is well-known that many people who either want to specialise or wish to take a genuine and intelligent interest in these discussions would be grateful for some preliminary guidance. The writer of this article himself remembers the time of his novitiate and has a vivid recollection of his early blunders owing to the absence of a proper introduction to the subject. He is even now more or less a beginner in the study of Public Finance and Political Economy in British India but he has read and suffered enough to believe that he has discovered a true method of work. He proposes in this paper to summarise the general results of his study in the hope that his blunders may prove a warning and his experience may be of some value and use to the army of young men, happily growing larger every day, who are seriously interested in these considerable and complex transactions of our civic and commercial life.

It is common learning that the necessary prelude to this species of enquiry as of all scientific and philosophical work consists in the discipline of elementary propositions and the abstractions of text-books, independently of figures and statistics. Facts and details are no doubt necessary but it is better to leave them severely alone at the outset. Marshall Nicholson, Walker, and Keynes are well-known guides at this stage ; but there is one risk that requires special mention in India. The tendency to ignore the classics of the subject, Adam Smith, Mill and Ricardo is a peculiarly insistent one in this country ; but there is no more tracing discipline than a conscientious attempt to master those ancient treatises. There are two advantages in this procedure. Acquaintance with these standard authorities is valuable in itself; the more valuable result is that the student will be forced out of the habit of assuming that the conclusions of one

single writer are of pontifical value. It is a trite observation that English political economy is very abstract. So it is but the historical and comparative method of tracing the growth of economic doctrines carries with it the remedy against its own vice. You can see the doctrines growing and there will be no danger of your assuming that the system of any single author is of ultimate and irrevocable authority. Instead of having to seek for criticisms in other authors like Cairns, Ruskin, and Bagehot, the student learns to criticise himself. But it is not wise to ignore acute criticism. In India, Ranade was the truest and most effective critic of English economic doctrines as applied to Indian affairs and the first paper in Ranade's *Studies in Indian Economics* will always be valuable. Bagehot's *Economic Studies* and *Physics and Politics* may be usefully consulted. But the book which set Ranade himself on his line of work was List's *National System of Economy* and no student can safely ignore that work. The net result of the conclusions would be that the abstract deductions of English Economy are true within their range but their application to Indian affairs should be inspired by a spirit of extreme caution.

The next step should be to confine ourselves to the methods of Public Finance. I do not wish to enter into the controversies relating to the connection between Public Finance and Political Economy. Adam Smith and Mill—as also their successors have devoted portion of their treatises to Public Finance but more special treatment is necessary. Prof. Bastable's *Public Finance* is the most satisfactory work with which the writer is acquainted but Sidgwick's '*Political Economy*,' Book III. may also be referred to. There is one advantage in Bastable's book—reference to India is often made for illustrating the discussion. As the Indian Government are interested in the Council Bills, Goschen's *Theory of Foreign Exchanges* should be carefully studied; as auxiliary to it Clark's work on the same subject and Bastable's Treatise on *International Trade* may be consulted.

This preliminary course over, the student may now come to close quarters with the subject of Indian Finance and Economics. The two matters must be clearly distinguished but the books so far written have confused them together. The student had best begin with Vols. III and IV of *Imperial Gazetteer*—he gets a fair idea of the magnitude and complexity of the task. The machinery of Finance can then be followed up in the first section of the *Report* of the Royal Commission on Indian expenditure (the evidence may be reserved for a later stage; as also the Report of the Minority The progress of Revenue and Expenditure is a more difficult matter but there is a connected view in Mr. Gokhale's evidence before that Commission. From that time onwards, the *Statistical Abstracts* of the Government of India must be consulted and the right guide to them is of course, furnished by the *Financial Statements* of each year. A more simplified view may be had in the chapter on Finance in the successive Reports on the *Material and Moral Progress of the East Indies* (Annual Publication). It is a little too bald and dry. That is why I think the *Financial Statements* are to be preferred and the *Material and Moral Progress* Reports may be kept for reference. In this connection Mr. Gokhale's Budget speeches (Natesan's Edition) should be referred to for the strongest presentation of the Congress and non-official view. Mr. Wacha's *Recent Indian Finance* is purely financial criticism. It would be beyond the scope of this paper to refer to special subjects like Taxation, Land Revenue, Military expenditure, Home charges and so on; but in view of the wide popular interest in the subject at present, Currency may be specially mentioned. The best introduction (the conclusions are too vague) to the subject is Mr. Sarma's *Indian Monetary Problems.* Mr. Howard's *India and the gold standard* states the official case—the literary garb is not very inviting but it is an instructive book. Then *Britain's Dilemma* by Mr. W. De P. Webb is a vigorous and arresting piece of work and sustains a bold plea for the free mintage of goldin India.

There is some effective criticism of the Financial methods of the India Office. Amongst original sources there are the Reports of the Herschell and Fowler Committees. A collection of papers on *Currency Reform* in the seventies of the last century is a little antiquated but there are some opinions which are still useful.

In the domain of Indian Economics, the output is more plentiful: Ranade's book has been already mentioned. It is a well known work and it has so far established itself that its criticism of English economical methods has become part of the back ground of the economic mind in India. Ranade himself did not cover a wide field in the *Studies*—one illuminative generalisation, some gleams of prophecy since come true a few practical suggestions, and evidence of wide research, these sum up Ranade's achievement. Amongst the younger workers, Prof. Sarkar's *Economics of British India* is an extremely useful performance. I have found this work the most helpful and the rigidly analytical method has assured a degree of lucidity and sense of clear-cut boundaries not found elsewhere. But he may be said to represent in some measure the reaction against Ranade Prof. Kale's papers are always interesting and he carries forward the tradition of Ranade. Mr. G. Subramania Iyer's *Economic Studies* are a little old fashioned and they do not meet more recent criticism. Within recent years two Englishmen have written on Indian Economics and both of them have done it in the best spirit of English Economic Science. Prof. Lees Smith who was in India some years ago has published two books. *India and Preferential Tariffs* is a fine work and conceived quite in the way of the Manchester School. I have not been able to read the other book. I found Sir Theodore Morison's *Industrial Organisation in India** and *the Economic Transition in British India* extremely suggestive. The analysis is close and searching and his criticism of the 'Drain Theory' the strongest I have come across. Even though Sir James Peile's criticism of it when Mr. Naoroji was examined before the Royal Commission on Expenditure had a surer grip of facts, Sir Theodore's exposition is a master piece of generalisation, persuasiveness and massive argument. We do not hear very much of the 'Drain' now, either because it has become a common place of Indian Economics or because it has died a natural death; if ever it is re-stated, a resolute effort should be made to meet the argument in the *Economic Transition in British India.* I have tried to avoid pure controversy in my Bibliography but the 'dismal' school of Mr. Naoroji, Digby and others have so strong a hold on the popular imagination that it would be a serious omission to ignore them altogether. Mr. Dutt's books are very valuable though his conclusions have been controverted. *The Economic History of British India* and *India in the Victorian Age* cannot be dispensed with. Mr. Naoroji's *Poverty and Un-British Rule in India* and Digby's *Prosperous British India* constitute the law and the prophets for this school; but a curious echo of the same cry may be had in the *Writings and the speeches of G. V. Joshi*, an extra ordinary book which is likely to be more influential if it is a little sensibly edited. More copious reference to original authorities is deliberately omitted; I have attempted to give only an introduction to the subject and as far as possible, the books should be studied in the order in which I have mentioned them.

* John Murray, London, Price Rs. 5 nett.

India's Money for India.

The Hon'ble Mr De P. Webb, C.I.E., has sent round the following note to the papers:—

For the creation of wealth, four things are essential, Demand operating on Materials by the aid of Labour and Capital. India, with its population of 315,600,000—with its immense areas of rich, well-watered soils—with its great stores of minerals and vast volumes of valuable agricultural products, is perhaps more splendidly endowed with Labour, Materials and Demand than any other division of the British Empire. But India lacks cheap Capital. Whilst Great Britian's traders and manufacturers work by aid of capital borrowed

at 3, 4 and 5 per cent., India's merchants are handicapped by having to pay 6, 8 and 10 per cent. Indeed, at busy times of the year, and in many parts of the country, still higher rates are often paid in emergencies for short periods.

In these circumstances, it is of the utmost importance that India's monetary system shall be of such a kind as will facilitate and encourage the creation and inflow of cheap capital. Unfortunataly, monetary conditions in India have had exactly the opposite effect, and India has been, in consequence, doubly handicapped. Not only has cheap capital from abroad been hindered from flowing readily into India, but much spare Indian capital that might have been utilised in India for India, has been arbitrarily withdrawn from India and employed in England to the advantage and for the benefit of strangers.

Let me explain this double handicap. Owing to India's currency consisting very largely of over-valued, silver tokens liable in times of crisis to lose in value, the western world does not regard India's monetary system with the same confidence that it feels towards the monetary systems of Great Britain or Canada, or Australia, or South Africa. Consequently, private capital does not flow to India so readily as it does to many other countries, with the result that India does not derive the same advantage from the low levels of interest and discounts prevalent in Great Britain, that most nations of the western world frequently do. This is Handicap No. 1.

Then again owing to the Indian Mints being closed to the public (a most objectionable state of affairs that puts India, monetarily, on a par with Persia, or China), instead of India receiving the money due to her in settlement of the balance of her foreign trade, *automatically, through the agency of an Open Mint as England and every other modern, civilized country does*, the India Office steps in and so manages the adjustment of India's monetary receipts that instead of India being paid the sums due to her in money of the best quality, she is actively encouraged by the India Office to accept depreciating silver tokens. At the same time the India Office has withdrawn over forty millions sterling (£ 40,000,000) of India's spare cash and accumulated funds and reserves. This is Handicap No. 2.

This last handicap needs further explanation. Sovereigns are legal tender in India as well as rupees. (And sovereigns are admittedly the best and most widely accepted coins in the world.) It may be thought by some people that if India wants to import sovereigns, there is nothing whatever to prevent her from doing so. But there *is* something. There is the India Office in London shouting every week, in effect,—" Why send sovereigns to India that are legal tender in India for only Rs. 15 when this office will sell you fifteen rupees delivered in Calcutta, Bombay or Madras *for less than it will cost you to ship a sovereign to India*?" After all, business is business, and we cannot be surprised if exchange bankers and others accept the India Office's propositions, and purchase rupees delivered in India rather than go to the extra expense of shipping sovereigns to India.

Why does the India Office do this? The chief reason is the Home Charges. India, like most other countries in the world, is indebted to Great Britain for the loan of a certain amount of capital (borrowed by the Government of India for canals, railways and other reproductive works). Then there are pensions to civil and military officers, and other payments necessary for the general maintenance of a good administration, Altogether, these Home Charges amount to £ 15,17,000,000 per annum—a very moderate sum compared with the sterling debts of other countries. In order to meet these charges, the Government of India raises the necessary money by taxation, and this money it is that the India Office puts up for auction every Wednesday in London. Buyers in London give English money to the India Office and receive in exchange rupees in Calcutta, Bombay and Madras. As the India Office *must* have the money in London to enable it to meet the Home Charges, we can understand a certain anxiety on the part of the

India Office Officials to sell as many rupees as they can. This, then, explains why the India Office frequently sells rupees at cheap rates (*i e.* at lower rates than the equivalent of the cost of landing sovereigns in India). It is to make quite sure of having sufficient funds in hand in London to meet the Home Charges.

Unfortunately for India, the withdrawal of money from India has not stopped at the Home Charges. The India Office, although it has had no legitimate need whatever for the money, has nevertheless continued tosell rupees at such low rates that as much as £14,300,000 *in excess of its own Budget requirements* has been realised *in one year*. By continuing this indefensible policy of withdrawing from India more money than was required for the Home Charges, the India Office has during the last few years drained from India—the land of *dear* capital,—over £40,000,000 of India's money, most of which money has been subsequently invested and lent out in England—the land of *cheap* capital,—on terms that, in Indian eyes and compared with terms that could have been obtained in India, appear grossly unfair to India.

The public have had great difficulty in following and detecting all the particulars of this unwarranted drain of India's reserves and spare cash. Most people know that nearly all the Gold Reserve which the Fowler Committee of 1898 recommended should be held *in gold*, has been withdrawn from India to England and (*a*) invested—£16 000,000 of it--in British, Irish and Colonial securities, (*b*) deposited—£2,000,000 to £6,000,000 of it—in the Bank of England, and (*c*) lent out-over a £1,000,000 of it—to large money dealers in London.—all most objectionable proceedings from the point of view of India. Then again, many people have noticed that £6,000,000 in cash of India's Paper Currency Reserve—money that can only be legitimately employed in India for cashing the Paper Currency—has now been transferred to London. The rest of the money—£15,000,000 to £18,000,000—has been drained from the cash balances in the Treasuries in India, and has been lent out in London with and without security to various banks and money-dealers.

A few figures and names must be produced in support of the statements. During the year 1912 from the money unnecessarily drained from India by the India Office, the following sums were deposited without securety with the following London Joint Stock Banks :—

London County and Westminster Bank ...	1,800,000
Glyn, Mills, Currie and Co. ...	1,550,000
London Joint Stock Bank ...	1,500,000
National Provincial Bank of England ...	1,300,000
Union of London and Smith's Bank ...	1,250,000

In addition to the above, the following private firms have also been favoured during the past year:—

Sums of over £1,000,000 lent to private firms:—	£
Samuel Montagu and Co. ...	1,050,000
National Discount Company ...	1,100,000
Union Discount Company of London ...	1,150,000
Sums of £500,000 and over lent to private firms :—	£
Sheppards and Co. ...	500,000
Hobler and Co. ...	500,000
Chartered Bank of India, A. and China ...	500,000
Brightwen and Co. ...	500,000
Alexanders and Co. ...	650,000
Reeves, Whitburn and Co. ...	700,000
Wedd, Jefferson and Co. ...	750,000
Other loans to private firms :—	
Allen, Harney and Ross ...	100,000
Anglo-Egyptian Bank ...	200,000
Baker, Duncombe and Co. ..	200,000
Biedermann and Co. ...	100,000
Blydenstein and Co. ...	150,000
Booth and Partridge ...	150,000
Bristowe and Head ...	200,000
Roger Cunliffe, Sons and Co. ...	450,000
The Eastern Bank ...	200,000
J. Ellis and Sons ...	200,000
Gillet Bros. and Co. ...	150,000
Haarbleicher and Schumann ...	150,000
King and Foa ...	200,000
Laurie, Milbank and Co. ...	100,000
Lazard Bros. and Co. ...	250,000
Lyon and Tucker ...	100,000
Matthey Harrison and Co. ...	100,000
Mercantile Bank of India ...	250,000
L. Messel and Co., ...	100,000
National Bank of New Zealand ...	150,000
Ryder, Mills and Co. ..	250,000
Henry Sherwood and Co. ...	50,000
Smith, St. Aubyn and Co. ...	250,000
Steer, Lawford and Co. ...	150,000
Tomkinson, Brunton and Co. ...	150,000

It is of interest to note that of the cosmopolitan financiers who have been enjoying the loan of so much of India's money no less than ten firms have each been regularly and almost continuously for at least five years past, receiving roughly a MILLION STERLING APIECE of India's spare cash Here are the names of the favoured ten:—

Alexanders & Co.	... Since	1908	about	£ 1,000,000
Brightween & Co.	... ,,	1908	,,	,, 1,300,000
Bristowe & Head	... ,,	1909	,,	,, 900,000
Cunliffe R. Sons & Co.	... ,,	1909	,,	,, 1,000,000
Hobler & Co.	... ,,	1908	,,	,, 1,200,000
Hopkins & Giles	... ,,	1908	,,	,, 1,300,000
Reeves Withburn & Co.	... ,,	1908	,,	,, 1,300,000
Samnel Montagu & Co	... ,,	1908	,,	,, 2,000,000
Sheppards & Co.	... ,,	1908	,,	,, 1,000,000
Wedd, Jefferson & Co.	... ,,	1908	,,	,, 1,500,000

The most fortunate people, it will be noticed, appear to have been Messrs. Samuel Montagu & Co. They have apparently been the recipients of what amounts practically to a standing loan of about £2,000,000, (two millions sterling) of India's spare cash *for the last five years!*

It should be practically noted that these are among the "short" or "temporary" loans which are granted at low rates of interest *because they are only for short periods and may be recalled.* These short periods have, by repeated renewals, now extended through at least five years—possibly more.

Sufficient has now been said to show that a very real drain has been going on,—a drain that in the best interests of India, *must be stopped forthwith.* India, suffering from an insufficiency of cheap capital, should not be deprived of such accumulations of money as she may fortunately possess. On the contrary, these accumulations whether hoarded by ignorant, old-fashioned, country folk in their houses and barns, or by a well-informed, up-to-date Government in its Government Treasuries (and the Government of India with a cash balance running sometimes up to £30,000,000 is the greatest hoarder of all), should be placed at the disposal of, or on loan with those members of the public who are able to use them wisely in the public interest. It is for India's publicists, patriots, financiers, and bankers to educate the Indian country people, and explain to them the disadvantages of hoarding their savings and surplus cash in their houses. Such moneys if placed on deposit with some good bank, will not only yield interest to their owners, but they will at the same time enable the banker to utilise the capital for the development of Indian business of all kinds. This will be a great advantage to India. Government on their part can lead the way, and themselves set a good example by

(1) establishing a full-value, gold currency system with Open, Free, Gold Mints in which the whole world in and out of India will feel confidence;

(2) restricting all unnecessary withdrawals of Indian money from India, and confining the Home drawings strictly to the sums necessary to meet the Home Charges;

(3) reducing taxation and so absorbing the present gravely swollen Treasury balances and reducing them to a reasonable figure; and, in the meantime.

(4) freely lending to all Banks and Finance Houses in India substantial sums from the present Treasury balances, for short or long periods, with or without security, and at rates equal to or above those at which Banks and Finance Houses in London have been so long favoured.

Here is a policy which would tend to remove the financial difficulties under which India at present labours. It would give to India from abroad, as well as from her own sons, fresh supplies of much needed capital at moderate rates of interest. At the same time it would put into practical operation a principle which, owing to the absence of an Open, Free, Automatic Mint, has been allowed to be lost sight of altogether,—the principal of employing India's money *in India*, and *for India.*

The Educational World.

Education and Co-operative Banks.

IN his annual report for the year ending the 31st July 1912, on the working of the Co-operative Societies in the Punjab Mr. Langley mentions as an instance of the lines of progress on which the Co-operative societies are prepared to embark, a wish on the part of the Jullundur village banks to make a joint contribution of ten per cent. of their profits to form an educational fund for the benefit of their children. It will be better however, he says, to defer this scheme for a year or two until the percentage amounts to a really useful sum; but this proposal is interesting as showing what a stimulating effect the banks are having on their members' minds.

Rural Education and the Elementary School.

A small Bill which deserves earnestl attention has recently been introduced into the House of Commons. It is presented by Mr. Jesse Collings, and is entitled "A Bill to provide Agricultural Education and Nature Study in Public Elementary Schools." The Bill is designed to enable the local education authorities to give instruction in nature-study, fruit, flower, and vegetable growing, poultry and bee-keeping, budding, pruning and grafting, cow keeping, milking, rotation of garden crops, nature and properties of soils, use of manures, knowledge and choice of seeds, structure, life and food of plants, action of birds and insects on crops, use of simple tools, packing fruit, vegetables and other produce for market, and weather observations, and to provide such school gardens, allotments of land, buildings, workshops, tools and appurtenances, books, specimens of animals, birds, insects, minerals, plants, seeds, and other objects as may be necessary. A quarter of the cost is to be met by the local education authority, and three-quarters by the Board of Education, and it is laid down that "the Board of Education shall make such alterations in the code of regulations as may be necessary to secure that the subjects specified in this Act shall be subjects required to be taught in all public elementary schools situate within the area of rural districts as defined by section 21 of the Local Government Act, 1884, and of semi-rural districts as defined by section 9 of the Public Health Act, 1875. Thus, if this Bill becomes law, rural education in England will presumably be revolutionised by a stroke of the pen.

The Recruit for Industrial Work.

A lecture on "The Preparation of the Recruit of our Industrial Work" was given by Mr. James Graham, Secretary for Education in Leeds, at Leeds University, recently. Mr. Graham argued that the early age at which boys left the elementary school prevented their reaping full benefit from the education provided in the schools, and consequently that there was a strong case for the Government's raising the school-leaving age to 14 years, at least for urban districts. Under present conditions, any practical work taken inthe elementary schools must be taken at too early an age, and in a more or less spasmodic form. Boys who were going forward to a secondary school should be transferred not later than the age of 11 or 12, and a special two years' course should be organized for the boys who remained and who, in all probability, would get no other education. A suggested course was outlined, thoroughly practical in character, which should result in the production of the intelligent and adaptable type of boy required in the various branches of industry. Reference was made to an interesting educational experiment in Leeds, namely, the Day Preparatory Trades Schools, in which no specific trade is taught, but the principles underlying trades are dealt with. Notes were given of the successful careers of boys who had gone

through that course of training since 1905. It was of fundamental importance that the teaching staff in these schools should have had full practical experience in the the workshops. The necessity for careful selection of the boy's occupation, and of supervision and advice after leaving school, was considered, and attention was drawn to the wide opportunities which exist in the industrial field for youths of brain, grit and perseverance, and to the great possibilities of an industrial career as compared with that of a clerk.

Industrial Education.

The following extract from the speech of His Excellency Lord Pentland at the annual meeting of the Victoria Technical Institute will prove interesting :—" This country will be the poorer for the loss of all the inherited skill of which the contents of this hall are some evidence. That reminds me of what we have gone through in Great Britain. We have gone through what is often briefly characterised as an industrial revolution. While that revolution with the inventions which facilitated it gave rise to steam, electricity and all the rest of it—while those changes have added immensely to the material comfort and standard of life which is possible, which so far as we can see, would have come much more slowly than it has come without those great changes due to these inventions, still this industrial change has had its disadvantage that it has left almost no trace in many parts of the country, of native home industries of our own country. It is only during the last generation that efforts have been made in different parts of England, in Scotland, in Ireland and Wales to revive those home industries. Even the utilitarian objector is obliged to admit that in the face of all the mills and factories with which the country is studded there is room and there is function left for the hand industries. While that is so in Great Britain, surely it is even more so in India. In the first place, the obliteration in industries has not been so general or so complete. There are still much more numerous nuclei of those industries which may be developed, and in the second place there is a character about India which is native to India, alone not only in its vivid colouring in its scenes, in its sky, and the life of its people, in their festivals, in their family, in their village, and their religious life—all these must enter and influence the customs so that the productions of this country are interesting treasures and must be precious, and we must do our utmost to preserve them. In that I think is the strength of the appeal addressed to Indians especially, but it is an appeal which I am sure everyone will feel addressed to himself and herself and we must do everything that we can to restore to it the prestige of the art industries of India."

The Agricultural School, Bangalore.

An Agricultural School will be opened at Bangalore during the 1st week of July 1913. During the first year, accommodation for about 15 students will be available. The purpose of the school is to train, not specialists in the various agricultural sciences, but efficient and intelligent agriculturists. The course is, therefore, made as practical as possible and only so much scientific instruction will be given as is necessary for an intelligent understanding of the various agricultural processes. As the purpose of the school is to give training to those who intend following agriculture as a profession, preference will be given to those whose parents own land in Mysore and are engaged in supervising its cultivation. Tuition and lodging will be free and board will be charged at cost price. The course will, for the present, extend over two years. Should particular students show special aptitude for scientific work and should they desire further scientific training in any of the branches of agricultural science, arrangements will be made later for their further training.

Indian Technical Students in England.

The report of the Morison Committee has been presented to Parliament. It shows that Indian technological students generally do well, being quite up to the average capacity of their classes, provided they come with a fair grounding of education and practical ex-

perience. Those who, like most mining students hitherto sent, had not a previous acquaintance with the industry they propose to follow, do badly. In view of the necessity for practical experience in works, the report recommends an extension of the period of tenure of the state scholarships, which, it says, should range between three and five years. The Committee found very little evidence of racial predjudice against Indians who are readily admitted into those industries in which apprenticeship and pupilage are customary. The report urges a higher standard of selection in India, preliminary practical experience being highly desirable, and in case of mining students, indispensable. 'The average man' the report continues, ' can be trained in India. If he is trained here it should be at his private expense. But when the best men so far as human foresight can discriminate have been selected, it is false economy to give them anything but the best training.'

Commenting on this Mr. L. G. Khare, the Honorary Secretary of the Indian Guild of Science and Technology, writes to the *Times of India* to point out that if prejudice against Indians as coloured persons did not exist on the part of British manufacturers, the Committee of Inquiry was lacking in its very *raison d'etre.*

' We know very well in very many cases our efforts to secure an entrance in English factories of repute after paying the necessarily high premium and after fortifying ourselves with best notes of introduction available have miserably failed for no other reason than the simple one of the extreme reluctance of factory officials to work with coloured persons. Of course, we only try to obtain practical work in concerns where the apprenticeship and pupilage are customary. The intelligence of the Indian student in England must be at the very low ebb indeed, if he tries to secure an entrance where they are not customary. Racial prejudice is an ugly phrase and is capable of a variety of exhibitions as we in India do know. Call it by whatever name you like, some such feeling does exist on the part of the average English manufacturer. Specific instances of it where Indian students abroad came into contact with it are available at my office. Can we not however hope that when the Government of India spend about £900 for foreign courses in the technical training on each of their scholars, the India Office may see the utility of gently compelling firms under their patronage to take in these scholars for a period of practical work."

Commercial Education in Calcutta.

The *Statesman* has published a long interview with the Hon'ble Mr. W.A. Lee, President of the Advisory Board of the Commercial Institute in Calcutta, regarding the announcement made sometime ago with reference to the Bombay College of Commerce—in the establishment of which, Bombay has shot ahead of Calcutta, the only approach to a Commercial College in Calcutta being the Government Commercial Institute in Bow Bazaar.

' The Bombay Government, ' said Mr. Lee, 'has long set an example to the Government of Bengal in the matter of commercial education, and this step is the logical corollary of the consistent encouragement which it has long offered to it. Why did the Government of Bengal go out of its way three years ago in connection with the Commercial Institute? It should be clearly understood that the object of these classes was not to fit candidates for Government employment, that is to say, the Government refused to employ, in a clerical capacity, those who were more capably trained than those who had had a mere general training designed primarily not as a preparation for Secretariat work, but as a preliminary to a University career.

' What was the result ? Government service being generally supposed to be more profitable and requiring less work than other services, besides being followed by a pension, is usually the aim of students in Bengal, and any preparation for office work which bars the student from Government service is discredited. The Institute has accordingly failed to attract any large number of students, and I feel convinced that it was only kept going, in the face of such discouragement, by the enthusiasm of

the staff. 'Last year, for the first time, the Bengal Government permitted holders of the Institution certificate to appear in the examination for the clerical service of the Secretariat, but this concession applied to Calcutta only, and not to clerical appointments in the Mofussil, and the certificate is still not recognised by other provincial Governments, nor even by the Calcutta offices of the Government of India, such as Military Accounts.

"Very different has been the attitude of the Bombay Government to the corresponding commercial institution in that city. There, months before the orders of the Bengal Government I have just spoken of, the Bombay Government ordered that for certain Government appointments 'no matriculate shall ever be appointed so long as any candidate who has passed . . . . . is available'—and one of the examinations referred to is the senior commercial examination of the London Chamber of Commerce in Bombay."

Asked whether he thought there was room in Calcutta for a college of commerce on the lines of the institution about to be opened in Bombay, Mr. Lee expressed himself in the negative.

'You cannot create a commercial class by means of commercial classes,' he said, epigrammatically. 'There must be a commercial demand behind them. I do not say that there is room even in Bombay for a college of this sort, but I have no hesitation in saying that there is more room in Bombay than there is in Calcutta. In this centre the great commercial houses are run by Europeans, and what is the result? The superior positions are all held by men who are imported from Europe at great expense, and with regard to whom the mere possession of a commercial diploma is a secondary consideration; and as regards the inferior posts it is not worth while filling them with diploma-holders. In Bombay there is unquestionably a much wider field for locally certificated men in the higher walks of commercial life.'

With regard to the Government Commercial Institute, Mr. Lee considered that the best thing to do was to amalgamate it with the Technological Institute, in the event of that body materializing. By this means its scope and prestige, and therefore its usefulness, would be enhanced. One danger to be guarded against, he thought, was any excessive cheapening of the course. That was the great fault of the Engineering College at Sibpur. He himself was inclined to think that technical educational institutions should be Imperial rather than Provincial. Quoting from his recent speech in the Bihar Legislative Council, he continued: 'In many cases I am sure that, they would gain considerably in the manner in which they would attract students from other parts of the country. There is a technical institution in Madras that, I am certain ought to be Imperial. A dyeing department, with expensive machinery and teachers, is being added to the Sibpur Engineering College. I am far from suggesting that Sibpur is the best place for such a department, but when the best place has been decided upon it seems to me that such an institution or branch of an institution should be entirely Imperial, because there is no room for more than one in a group of several provinces.'

Manual Training.

In his Presidential address to the members of the National Association of Manual Training Teachers at the London Day Training College on March 26, Sir John Cockburn said that, where intelligence often led astray intuition led correctly. Manual work was the best avenue to the brain. Speech was the highest faculty of man, and this power of speech was called into function by the movement of the hand. If they wanted to reach the brain they must do it through the hand, and if they disregarded the use of the eyes and hands in education they were placing the brake on all mental development on the part of the child. A command to "keep still" in a school was the greatest cruelty they could possibly impose on children, and often produced deformity. After speaking of Professor Findlay's contention—based on experience at Manchester—that delicate children grew more when away

from school, Sir John Cockburn contended that physical and mental excellence went together. There were occasional exceptions, but as a rule the boys who were best at sports, especially those in which the muscles of intelligence entered, were also the best scholars. Children hurried to school when they knew they had manual work to do. The introduction of manual instruction meant that five or six hours a week could be knocked off class-room work, for its inclusion meant that the most abstract studies could be acquired in very much shorter time than otherwise. Commenting on Sir John Cockburn's advocacy of manual training, the *Times* points out that it must be taken with a few grains of salt. It says:—

As regards town-bred children, our system of elementary education doubtless errs by defect of attention to the things insisted upon by the Association. In the country, children have many ways of supplying themselves with manual training, and indeed often have a good deal of it forced upon them. They learn to be handy in a great many small ways, and they have a variety of simple amusements which bring into play both nerves and muscles. The opportunities of poor children in towns are much more restricted. In many cases they hardly know how to play, and that is one of the saddest things that can befall a child. Thus in towns there is real necessity for systematic attention to manual education, and it need be entirely absent even from country schools. Manual and mental education unquestionably help each other, but it is to be hoped that, in trying to remedy neglect of the first, educational theorists will not be led into the mistake of under-valuing the second. Man is a very complex creature, in whom there is no absolute demarcation of mind and muscle. Every function, on the contrary, is correlated with every other, and physiology is still a long way from unravelling all the subtle far-reaching consequences. Manual training is accordingly an excellent thing in its place, but it does not offer any royal road to education. There would seem to be some danger lest, in the joy of learning what physiologist have long been familiar with, the enthusiasts of manual training may strive to substitute one kind of lopsidedness for another. At least some peril of this sort is suggested when Sir John Cockburn declares that "manual work is the best avenue to the brain, and that, if we want to reach the brain, we must do it through the "hand."

It is only intelligent hand work that can help the brain. Hand work that is not intelligently directed leaves the worker a clown. But the intelligence can come only from the brain; consequently the brain must be reached through other avenues and set in motion by other agencies. When the brain is set to work, when intelligence is awakened by some mental stimulus, then it is advantageous to add some form of manual training, connected with and appropriate to what is being taught through the brain. It is a very old educational demand that boys should be enabled to handle things, and not be merely taught words that refer to things. The highly trained mind may deal in abstractions and general conception, but the growing mind needs concrete facts and instances to help it along. An average boy finds the 47th proposition of Euclid rather taught and uninteresting. But, if you show him how to set out the angles of a tennis court with twelve feet of string having a couple of knots upon it at the appropriate distance from the ends, he will ever after regard the hypotenuse as a friend. Show him how to make a telescope tube for himself with a sheet or two of brown paper, and he will take a new interest in optics. A rough model, even in pasteboard, of the essential parts of a reciprocating engine, a thing which he can handle and move and perhaps imitate, will help wonderfully to quicken his progress in book studies. The teacher may have a mental picture of a cylinder and a piston and a crank, but the boy has not, and the empty words bore him and are learned by rote. If you want to interest him in geology, do not merely talk about quartz and geniss and red sandstone. Give him

pieces of those things and show him with hammer how they differ in hardness, in texture, in mode of fracture, and so on. That is the kind of manual training that helps the brain, and the want of it is what provides the too common spectacle of expensively-educated persons who only know the names of things and not the things themselves. Manual training at large occupying children's hands with things which do not connect with mental training may be interesting and even useful in a way, but we must not mistake it for education. It is only in conjunction with intellectual training that manual training becomes valuable, but then it is more valuable than has yet been recognized in our educational systems.

Agricultural Education in the United States of America.

We extract the following from an article written by G. J. Bosman, B.S.A., to the *South African Agricultural Journal* of January 1913:—

Perhaps no other country in the world is doing more for agricultural education to-day than the United States of America. In each of the forty-eight States and Territories constituting the Union is an agricultural college with an average attendance of about 400 students. In connection with each of these State colleges is established at least one experimental station equipped with an efficient staff of agricultural experts. Furthermore, in a great many States they have gone so far as to have a special agricultural teacher in each high school and normal college. Teachers in the rural public schools are required to have a knowledge of the elements of agriculture so that they can devote a few hours each week to the teaching of that. The American people realize the necessity of teaching the farmer his profession. Through the colleges, high schools, and experiment stations only a small percentage of the people is reached, so another institution or force was created with special purpose of taking scientific knowledge of agriculture to the homes of the farmers. This force was called the Extension Department. The Extension Department teaches the farmer agriculture , his wife, household science ; and the boys and girls are being interested in the junior work of these two branches.

The following are a few methods used in imparting this knowledge to the people :—

(*a*) Short winter courses held in local communities lasting from one to two weeks, and covering the studies of field crops, soils, live stock, and home economics.

(*b*) Special educational trains traversing the State, on which are discussed such subjects as mealie culture, hog raising, dairying, and domestic science.

(*c*) Farmers' institutes, boys' judging contests, boys' camps, farmers' picnics, &c., are supervised by the Extension Department.

(*d*) Experimental and demonstration work on county farms is conducted by the department.

(*e*) Dairy test associations are formed by the department.

(*f*) Organizations, such as agricultural clubs, farmers' co-operative organizations, &c., are established.

(*g*) Schools, both secondary and common, county superintendents and teachers' institutes are held.

(*h*) Junior work with boys and girls is carried on.

(*i*) Publications, such as bulletins, circulars, leaflets, and score cards, are issued and distributed by the department.

(*j*) Correspondence covering all sorts of questions pertaining to the farm and home is answered.

SCHOOLS.

The best way of reaching the largest percentage of boys and girls upon farms with information on agriculture and domestic science is through the medium of the country school. The Extension Department is doing a great deal in promoting the idea of having agriculture taught in the country school. The need of teaching agriculture and domestic science in public schools is obvious if we take into consideration that only a fraction of one per cent. of the pupils of schools ever attend college.

Already much is done in the United States of America to get agriculture taught in the public rural schools. The development of this line of work is of the greatest importance as it affects the rising generations of the nation.

JUNIOR WORK.

In the State of Iowa, United States of America, seven thousand boys and girls are taking special work in mealie-growing, gardening and domestic science. This work is done according to directions sent out by the Extension Department. The competition among these youngsters is strong in the annual contest and exhibits held at short courses. A couple of years ago the highest yield of mealies produced per acre by one of these boys engaged in this kind of work was 118 bushels, or in South African measure 38 bags. This boy has consequently done a noble work by getting four times as much as the average yield of the mealie belt of the States. He has demonstrated to the farmers the possibilities of mealie culture in the States. The boys in the different countries carrying on this work, obtaining the highest yield, were given a free trip to Washington, and had the honour of being the guests of the President for a few days. The girls who had won in the cooking and sewing contests were given the same privileges. In America the question is not how to arouse interest for this work among the youth, but to get help enough to keep up with the demands for this kind of work among the people.

ORGANIZATION AND CO-OPERATION.

Probably the greatest need among our farmers to-day is organization. The rural people need debating societies, clubs of various kinds, and organizations that will "boost" for better agriculture and the welfare of the farmer.

Hand in hand with organization goes co-operation, without which not much can be done to promote agricultural interests. The "working together" of the farmer and the business men in towns in the States is noteworthy. The business men are ever ready to assist financially and ersonally in all kinds of work like the organizing of a short course, giving premiums for contests and exhibits &c.

The press also lends valuable assistance by using their papers to advertise and consequently make more successful short courses, institute work, and special agricultural trains. They also open their columns generously for disseminating information that help towards the upbuilding and bettering of agriculture throughout the country.

The above brief sketch of the different branches of work carried on by the department gives a general idea of the scope of the work. The prejudice some of the farmers had at first against agricultural experts has died away long ago. The American people have wakened up and are demanding agricultural education. The Extension Department with its staff of energetic bright men is the powerful machine that is revolutionizing the agriculture of to-day. Through the efforts of this organization more agricultural products are produced, better men and women are made, and happier homes are being established.

May the day soon dawn in India when we shall have such a powerful force at work which will revolutionize agriculture in our country, the same as was done in the United States of America !

Industral Training in India.

Commenting on the Atkinson—Dawson Committee's report, the Rev. H. Fairbank of Ahmednagar gives a few conclusions that he has come to from his experience in industrial training in India. He says:—In the first place the trades suitable to be taught are very few. By suitable I mean trades that a boy is likely to follow or will, be able to follow after he leaves school. With the exception of carpentry and fitting and black-smithing the trades that can be taught on any large scale are hard to find. Those that would require a goodly number of workers are hedged about by caste to such an extent that the low-caste boy is not allowed the privilege of practising them, unless the mission itself starts a factory or workshop,

and in a number of places this has had to be done. The trade of weaving cloth on handlooms has had the serious handicap of competition with mills, or of the inability of our ordinary boys to acquire skill sufficient to make a living on an ordinary handloom. Here at Ahmednagar and in one other place at least, of which I know, Persian pile carpets are made, but the Mission has to run the workshop, and the working capital for wool and for goods unsold is considerable. There is no urgent call for boys trained in our schools, except for positions as carpenters and fitters and blacksmiths, and there is not an unlimited demand for these. So the Missions that have gone into the industrial training of boys and girls have had to do double duty, train the boy or girl, and also supply the work. Where this can be done on a commercial scale it is helpful, but where the missionary struggles along on an insufficient capital and works with a poor plant, it is discouraging.

2nd.—Experience in my own case, and in the case of others with whom I have talked, has shown very clearly that any kind of a literary education gives the boy the idea that he is above manual labour. This does not mean that he is not to be taught to read and write, but it does mean that the manual training or the teaching of a trade should be made the important thing, and abundant time given to it, and the other, the literary part, should be made subordinate. Boys who have had any considerable literary training will leave their trade and accept the post of clerk or of teacher or preacher, if they have the opportunity. I have in mind two good carpenters, who are now preachers. This matter will be corrected by time and experience and by the extension of primary education. But at present one has to be chary of giving any considerable education.

3rd—The matter of actual experience under commercial and practical conditions is a most important one. The work in carpentry in the Sir D. M. Petit School at Ahmednagar started as a manual training class with the idea of the educative value of the training as the important thing. But the important thing now is to give the boys a training under the actual conditions of the workshop so that he will realise what his work is worth, and what it really means to be a carpenter. We pay two rupees and-a-half for making a chair. One bay will finish in four or five days, another boy will take two weeks to it. Until those two see their work side by side they will not get an idea of the commercial value of their labour. Further we have found that a boy may be able to make a beautiful joint in the manual training class, but he gets no adequate conception of the meaning and purpose of that joint, till he puts it into an actual piece of furniture.

In the weaving class connected with the school this principle comes out also very clearly. The boys start to make a coarse cloth that is used for a good many purposes around here. We pay them, when they are really able to weave, two annas and-a-half for thirteen yards of this cloth. Some boys will earn seven annas and-a-half a day, others will earn not two annas a day. They learn that speed is an essential factor in their work. This is very different from working at a loom and not caring how long it takes to weave a certain amount. We have had a weaver, who has had experience on the ordinary handloom, come in and take longer to make a yard of cloth on our improved loom than he would take on the ordinary loom, and think he was doing very well to make some very nice cloth but he did not realise that commercially he was not accomplishing anything worth talking about.

The result has been to allow all the boys in time to come to a place where their living depended on their work. It does not take long for them to see the value of long hours and strict attention to work.

In conclusion, let me say that the following three matters seem to me most important in determining any particular line of industrial training.

(1) The difficulty of getting suitable trades to teach that are profitable to the boy when he gets through his training.

(2) The amount of literary education to give.

(3) Work in a workshop under actual commercial conditions as the final stage in the training.

INSURANCE.

Rajas and Insurance.

An interesting sidelight on what Insurance Companies in India consider to be good and bad risks is furnished by Dr. Adrian Caddy in the "*Indian Medical Gazette.*" He says that the classes of risks considered bad are Rajas and wealthy land-owners,—persons corresponding to West-End lives at home. "The risks," he says, "often live lives of extreme luxury, surrounded by courtiers and poor relations only too anxious for their speedy demise, and except in a few cases there is no athletic spirit as in England which can counteract the effects of rich living; when they insure they do so for large sums and there is often difficulty in making a satisfactory medical examination owing to their dislike to visiting the examiner's house. Native female lives most companies will not insure on any terms. Female life is not held in the same esteem as male life, and death, result of inattention during confinement, accounts for a high female mortality."

Profits of Insurance Companies.

Those who are conversant with the business of life assurance know that the profits of such companies are practically derived from the following sources :—

(1) Interest on the life assurance funds earned in excess of the rate assumed in the valuation.

(2) Loading on the premiums not absorbed in expenses of management.

(3) Favourable mortality experience.

(4) Profit on lapses and surrenders.

(5) Profit on non-participating policies.

(6) Profit on investments realised.

But the proportion in which they contribute to the total profit of any given period will vary not only with the constitution and methods of each individual company, but may be affected favourably or otherwise by general financial conditions and the policy adopted by the management in estimating the liabilities.

The above classification may be said to indicate approximately the order of the relative financial importance of the various sources of profit in the case of an old-establised life office with strong reserves, doing a moderate new business, and carefully selecting the lives of its members.

Co-operative Cattle Insurance.

In a recent issue of the *Agricultural Journal of India*, Mr. A. W. Fremantle draws attention to the possibility of forming co-operative cattle insurance societies in India. He points out that one great drawback to the poorer class of cultivators keeping good cows is the risk of their death : and if by the payment of a small sum per annum this loss could be recouped to them, it would go some way at least perhaps in solving two vital questions of the day—the rise in price of plough bullocks and of milk, ghee and other milk products. In England and Wales, this kind of insurance has been in existence for nearly a century, between 20 and 30 societies having been formed and the small farmer is their greatest supporter. One society has a surplus fund of £1,176. Mr. Fremantle calculates that premiums in India might be at the rate of 6 pies per rupee on the estimated value of the animal in the case of cows and calves and 9 pies per rupee for working bullocks. Owners with a reputation for underfeeding or overworking their cattle would be refused admission to a society. In tracts liable to fodder-famines, the principle of co-operative insurance could not well be applied, but it is suggested that a trial might be made in canal-irrigated and sub-montane tracts, and also in parts of Bengal where there is always plenty of fodder. Nothing so far has been done in India in this direction though the subject has been mentioned at meetings in connexion with co-operative credit societies. In Burma, however, 23 cattle insurance societies have actually been formed and they are working successfully. The rules of these are published in the "Journal" and they are well worth attention by District Officers and others interested in the cattle question as a whole.

MACHINERY, SCIENCE AND INVENTION.

Revolution in Cold Storage.

News from Tasmania states that Mr. Reginald Crisp, a savings bank clerk, has, after ten years' research, invented a process which is claimed to obviate the use of elaborate machinery for refrigerating purposes, and which "appears likely to revolutionize the whole system of cold storage." It is stated that Mr. Crisp has sold his invention to a United States syndicate for a large sum of money, £750,000 being the amount mentioned.

Paper Pulp.

That the West Indies may soon be exporting large quantities of pulp for paper making is the prediction of the *Canada-West Indian Magazine*, published in Montreal. It claims that experiments conducted in Wisconsin have resulted in a new process by which a revolution will be brought about in the sugar world, for not only will it be possible in the future to extract 100 per cent. of the saccharine juices from the sugar-cane, but valuable by-products will be created, in particular cane fibre, which, it is claimed, would yield a good profit for paper-making.

A Sheep Protector.

An invention to protect sheep from the inroads of wolves and other animals that prey upon the flocks has been devised by Mr. E. C. Winchester, and has been pronounced by sheep men to be the most practical device that has yet been offered for scaring away wild animals and keeping the sheep together at night. The machine consists of an automatic gun which will shoot a blank cartridge every 30, 40, or 60 minutes, as arranged, while a bull's eye lantern is so adjusted as to revolve and flash its light in every direction. It makes more than one revolution a minute, operating by means of a coiled spring and cog-wheels, a sort of clock-work, in fact. The mechanism is enclosed in a storm and dust-proof metal case and mounted on four adjustable legs. It has a weight of 25 pounds, so that it can be moved about without difficulty.

A New Milking Machine.

In the advertising columns of the *Queensland Agricultural Journal* of February, 1913, will be found particulars of the first Queensland invented and patented milking machine. The invention is by Mr. R. E. Shepperson, an up-to-date young dairy farmer. The "Shepperson" milking plant consists of a vacuum pump, vacuum tank, line of piping over the bails with vacuum gauge, safety valve, and gun metal pulsation, and vacuum taps of simple and effective design, nickel-plated to ensure cleanliness. The claw is also of gun-metal and plated; and this, with the special teat-cup inflation, may be said to be the live part of the "Shepperson" invention. Each teat-cup is supplied with a tap, and when the cup hangs down the tap is shut and the vacuum "off." As each cup is raised to attach to the teat the tap opens, and the vacuum is "on." Thus one teat or more may be milked at a time; in fact, in one herd milked by the "Shepperson" patent is a cow with only two teats. She is milked with the ordinary claw, with two cups hanging down and thus automatically shut off. The rubber inflation is perhaps the most important part of the plant. It is unique in design, being oblong in section constructed with longitudinal threads to prevent elongating, and with steel spring insertions embedded in the rubber to control the action on the cow's teat and imitate the action of the hand in milking. Shepperson milking plants are being installed on the Northern Rivers of New South Wales and in different dairying centres in Queensland.

The Red Radish.

An alcoholic solution of the skin of a red radish serves as an excellent indicator or test for acids and bases. In the presence of acids the colorless solution turns pink while with bases—alkaline solutions—it turns yellow. It is well known that many plant extracts such as litmus and animal products like the cochineal bug possess this property, but no other indicator is so simply made.

HINTS AND RECIPES.

Flavour of Vegetables.

If you wish to bring out the flavour of vegetables to perfection, add a teaspoonful of sugar to the water in which they are boiled.

Petty Savings.

Every shilling that a business saves on its cost of maintenance or production represents interest for one year at five per cent. on a capital of one pound. Take care then about little leakages and small wastages.

Cleaning Blackened Chimneys.

Sometimes when lamp chimneys have become very blackened with smoke, water alone will not remove the grease. But it can be removed without any trouble by mixing a little spirits of wine with the water.

A Simple Milk-Test.

Place a drop of the milk desired to be tested on the thumb-nail. If it runs over the nail, without stopping in the same place, adulteration has taken place.

Blackening Tan Leather.

To blacken tan leather it should be first rubbed with a ten per cent. solution of tannic acid. Let this solution dry thoroughly, when a ten per cent. solution of iron sulphate should be applied. This gives an intense black, is easily applied and is harmless to the operator.

All Round Knowledge.

A man who is engaged in a selling business should make it his business to learn all he can about the manufactnring business. A manufacturer is a slow person if he does not glean a knowledge of the business of Salesmanship.

The Refractory Collar Button.

Use paraffine on the back of a button-hole to facilitate the passage of a collar button or as paraffine is not always conveniently near, hold that part of a collar or cuff containing the button-hole between the tongue and the roof of the mouth about three seconds, and the starch will soften, rendering the button-hole so pliable that the most obdurate button will easily pass through.

Removing Paint from Glass.

To remove paint from glass a strong and hot solution of acetic acid should be applied with a cloth. As this is very effective, care should be taken that the solution does not touch painted wood surfaces. The solution is harmless to the hands and may be applied directly to the glass from a cloth steeped in the solution.

Adulterated Butter-milk.

The whey of unadulterated butter-milk has a specific gravity of from 1·0250 to 1·0275.

If the specific gravity of the whey is below 1·0250, the butter-milk may be regarded as adulterated with water.

Further, the ratio between the specific gravity and the amount of water added remains constant, *i.e.*, the specific gravity falls on an average 0·0010 with every 5 per cent., addition of water; thus this method affords a means of determining with some accuracy the amount of water which has been introduced. In this way, adulteration in butter-milk samples can be quickly, easily, and sufficiently accurately detected.

The Care of Books.

Persons about to install new libraries, or those who find their books in bad condition, will be glad of the advice offered on this subject by a writer in *Les Annales* (Paris). Glass cases should always be avoided, except for a few precious volumes which are specially looked after and frequently dusted, since the confined atmosphere and lack of air-circulation in such book-cases is favorable to the development of germs, insects, and mold. Secondly, the simple precaution should be taken of placing on the shelves behind the books strips of cloth or flannel moistened with benzine, phenol, tobacco juice or turpentine. These strips give excellent results if renewed from time to time.

HEALTH AND HYGIENE.

Nicotine.

Nicotine, the active principle of tobacco is claimed by chemists to be, next to prussic acid, the most rapidly fatal poison known. Whatever differences of opinion there may be upon the advisibility of smoking for men, there is none whatever as to its pernicious effect on boys. The tender tissues of a growing boy can not absorb even a small quantity of it without most serious results. Cigarettes are particularly injurious.

Stooping Children.

If a child shows a tendency to stoop, keep him in the open air as much as possible, give him plain, but nourishing, food and let him do a few physical exercises every day. If, after a few weeks of this, you see no improvement, take him to a doctor, for it is always possible that stooping may be due to some weakness of the spine, and the child may need special treatment.

Remedy for Sore Throat.

One of the best old remedies for sore throat is to roast a potato, then crack it, place it in a piece of flannel, and apply it very hot, when the steam from it will be found to have effected a cure in one night ; or an obstinate sore throat is cured with a little alum dissolved in sage-tea sweetened with honey.

Points for Thunderstorms.

Every year quite a large number of people are killed by lightning because they did not know what to do in a thunderstorm.

First of all, it is safer to be indoors than out. Most people get killed when out in the open. If you are caught in a thunderstorm, then don't be afraid of sheltering under a tree just because you have heard that it is dangerous.

It is dangerous to shelter under a solitary tree, because lightning likes to strike the highest point, and a solitary tree is the highest point as a rule for some distance round. But you are pretty safe if you take shelter in a wood. A tree in a wood is seldom struck.

Avoid big crowds and collections of animals. For some reason—probably the warmth that rises from their bodies—crowds of animals and persons are liable to be struck by lightning.

Effects of Coffee Drinking.

Professor Hollingsworth of the Columbian University has published the results of some interesting experiments on the subject of the effect of coffee on human beings. Four cups of average coffee contain about six grains of caffein, and four grains can be taken without nervousness, headache or irritability. The power of stimulation depends upon the weight of the subject, the lighter the individual the greater being the stimulation. All the subjects experimented upon uniformly reported improvement in health, spirits and general efficiency, at the close of the experiment.

Preserving Sight.

The child's eye-sight is a possession he cannot be expected to appreciate without help. In every text-book in one large American city is to be pasted a label containing the following :—

Your eyes are worth more to you than any book.

Your safety and your success in life depend on your eyes ; therefore, take care of them.

Always hold your head up when you read.

Hold your book fourteen inches from your face.

Be sure that the light is clear and good.

Never read in a bad light.

Never read with the sun shining directly on the book.

Never face the light in reading.

Let the light come from behind or over your left shoulder.

Avoid books or papers printed indistinctly or in small type.

Rest your eyes by looking from the book every few moments.

Cleanse your eyes every night and morning with pure water.